FARM CHEMICALS

July Volume 123 No. 7 50 cents
Pioneer Journal of the Industry

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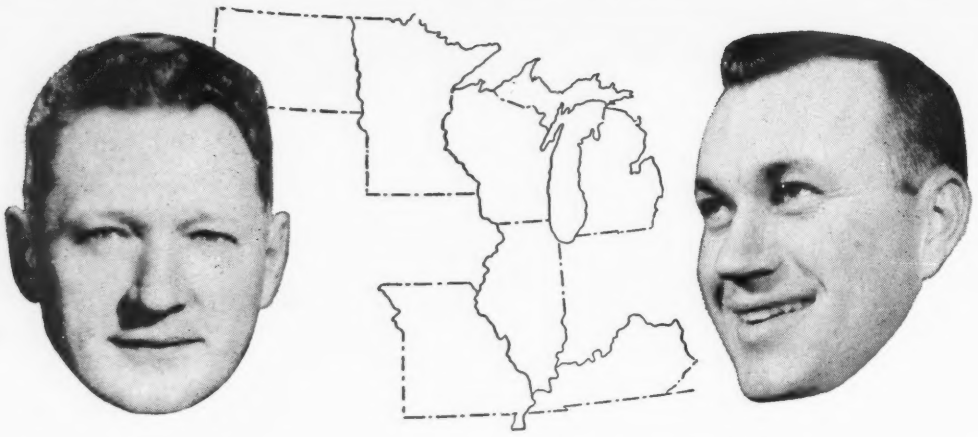
A farm supply dealer lists 13 ways to improve fertilizer merchandising



RUSSELL L. GULICK,
as a P.C.A. Sales Representative, covers Minnesota, North Dakota, Wisconsin, Michigan and Northern Illinois. A graduate of the University of Richmond, he has wide experience in the fertilizer industry.

THEODORE B. NEELEY
is the P.C.A. Sales Representative for Kentucky, Missouri and Southern Illinois. He is a graduate of the University of South Carolina and has been a member of the P.C.A. Sales team since 1953.

Your Men on our payroll

These men are two of the members of the P.C.A. sales team serving the fertilizer industry. While they are on our payroll, their chief responsibility is to you. Selling potash is but part of their job; the most important part is furnishing you with whatever service and information you require . . . both have the experience and background to do the job well. The P.C.A. salesman is your man . . . make good use of him.

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New 60% Special Granular Muriate
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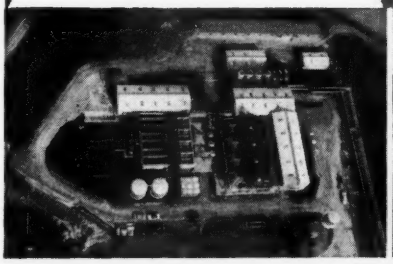

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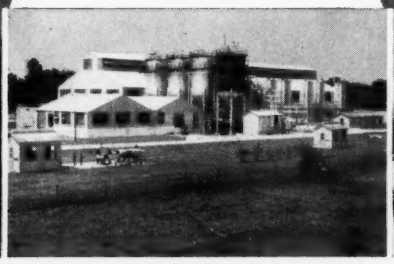
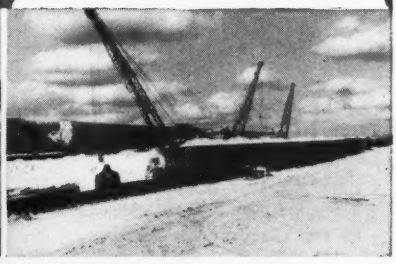
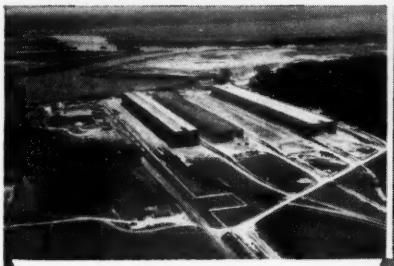


NEWGULF, TEXAS





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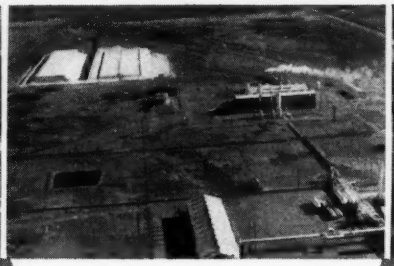

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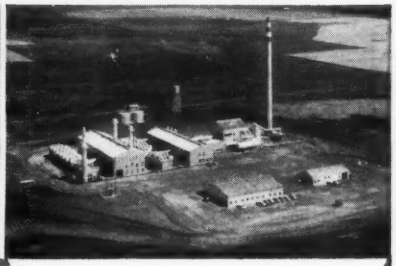

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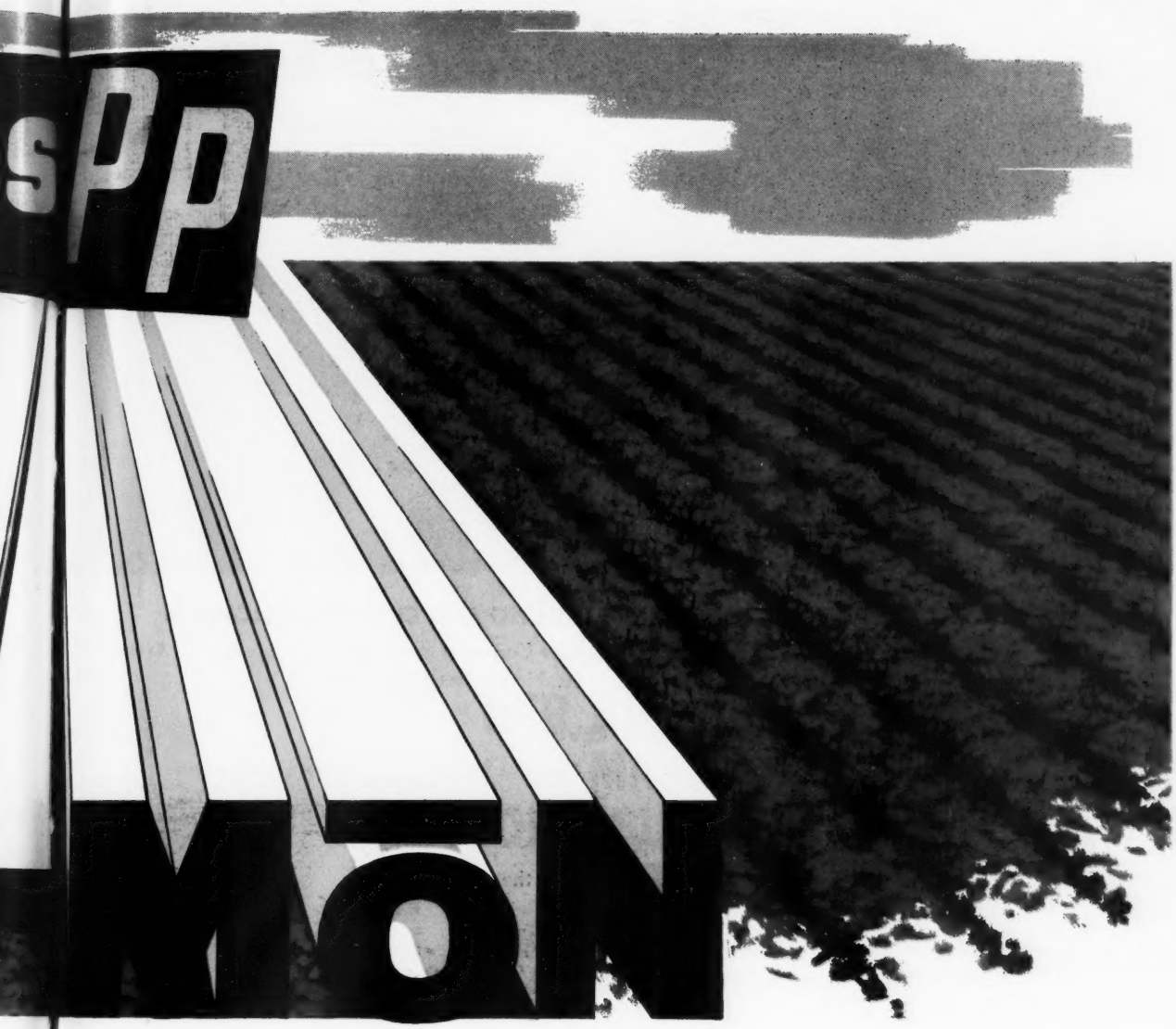
The Country's Largest and most Dependable Source of Phosphate Products for High Analysis Formulations!



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BPA
MEMBER BUSINESS PUBLICATIONS AUDIT

The national business magazine for the fertilizer and pesticide industries, FARM CHEMICALS, serves primarily those persons responsible for management, marketing and production. It has a qualified circulation for selected executive and supervisory persons within specified segments of these industries, as well as in certain closely allied fields. Subscription rates to all others are: in the U.S., its possessions, Canada, Cuba and Panama: $6.00; in other countries: $7.50. Current issue 50 cents. Back issues $1.00. (Current issues become back copies on the 5th of the month following publication.) Established in 1894 as *The American Fertilizer*.

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FARM CHEMICALS

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THE COVER PICTURE

Going over a truck record sheet used to measure cost of goods hauled for Rolla Feed Mills is Murray C. Renick (center) of that company; F. M. Feffer, Sr., Arizona Fertilizers, Inc. (left), and Ralph E. Everett of Empire Sales Training, Inc. Renick spoke at the National Plant Food Institute convention at the Greenbrier. Subject: Merchandising, promotion and business management in the fertilizer, feed and farm supply business. Everett spoke on the same program, his title being "Sell a Mental Concept."

An American Cyanamid Company metallurgist runs flotation test on prospector's sample, a key step in evaluating worth of phosphate deposits.

HER BUSINESS IS MAKING YOUR BUSINESS BETTER

Like all the men and women in Cyanamid's phosphate operation, her only business is phosphates for your mixed fertilizers

She's one of several hundred Cyanamid people who mine, process, research, deliver and service phosphatic materials for your acidulation and mixed fertilizer business. These people put Cyanamid's more than 40 years of phosphate experience into the kind of products and services you can use. Take advantage of both. Pick up your phone and call your Cyanamid representative.

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Traffic Service: Cyanamid traffic specialists are ready to route and ship your orders without delays. Their knowledge can save you money and can make your operation run even more efficiently.

Technical Service: Cyanamid's staff of technical experts are on 24-hour alert. Often, what are new problems to you are solved problems to them. Make your formulation and production problems theirs. That's their job.

Sales Service: Cyanamid sales representatives are available to work with and for you in expanding present markets or in establishing new markets.

Products that serve: Cyanamid's only phosphate business is mining and manufacturing the highest quality products for your mixed fertilizer requirements.

- Florida Natural Phosphate Rock
- TREBO-PHOS® — Triple Superphosphate
- Phosphoric acid for acidulation

To manufacture fertilizers that sell . . . mix with Cyanamid's phosphates and service.

American Cyanamid Company, Agricultural Division, N. Y. 20, N. Y. *®TREBO-PHOS is American Cyanamid Company's trademark for its triple superphosphate.*

CYANAMID

PHOSPHATE PRODUCTS

CYANAMID SERVES THE MAN WHO MAKES A BUSINESS OF AGRICULTURE

WHAT'S DOING IN THE INDUSTRY

F
C

DIAMOND ALKALI PLANS TO EXPAND BELLE PLANT

Plans to initiate a long-range expansion program at the Belle, W. Va., plant of the Chlorinated Products Div. of Diamond Alkali Co. have been announced by L. P. Scoville, Division general manager.

Initial work will include erection of new buildings and replacement of operating equipment to take advantage of recent process improvements.

R. J. Martz, local plant manager, said that construction will start as soon as engineering work is completed.

POTASH EMPLOYEES GET WAGE BOOST, PRICE INCREASED

Wage increases of eight cents an hour the first year and nine cents an hour the second year, plus other benefits, are included in the new two-year labor contracts between four unions and potash companies producing at Carlsbad, N. M.

Following the pattern set by U. S. Borax & Chemical Co. in April, other leading potash producers said they were boosting prices on agricultural grades by about $1.80 a ton, effective July 1. U. S. Borax said it will increase price of chemical grades by about $2 a ton, effective July 1.

The increase will boost July and August shipments of agricultural potash grades to about $19.80 a ton, said John W. Hall, president of Potash Company of America. Shipments next January will be $22.50 a ton.

SALES SLIDE

"Fertilizer sales slide, bringing widespread price cutting," the WALL STREET JOURNAL reported last month.

"Manufacturers say sales in the year ending June 30 will fall about 10 per cent short of the 25.1 million-ton record of the previous year. Mixed fertilizer retails in the Midwest for an average of about $70 a ton, as much as $2 under a year ago and the lowest level in about a decade."

EXPENSIVE GOLF SHOT

Bob Linderman, International Minerals & Chemicals Corp., made a hole-in-one at the Greenbrier, White Sulphur Springs, W. Va., during the National Plant Food Institute convention last month. He did it with a No. 4 wood on the third hole.

Meeting Highlights

THIS MONTH:

Eleventh Annual Pacific Northwest Fertilizer Conference

Salt Lake City, Utah

Sponsored jointly by the state agricultural institutions of Idaho, Oregon and Washington, and the Soil Improvement Committee of the Pacific Northwest Plant Food Association.

July 13-15. Among the speakers and their topics are Cecil Wadleigh, "Soil-Root Interface;" Walter Gardner, "Time-Lapse Film on Water Movement in Soil;" Frank Viets, "The Significance of Recent Nitrogen Research to Fertilizer Practice;" Sterling R. Olsen, "Application of Basic Research Findings to Phosphate Fertilizer Practices;" C. E. Kellogg, "The Fertilizer Program and Bench Mark Soils of the U. S.;" Keith Campbell, "Strategy Employed in Fertilizing;" T. L. Jackson, "Team Work between Grasses and Legumes;" and C. W. Cook, "Research Goals in Utah."

George Van Dyne on "Scoring in Montana;" Wilson Buck, "Cinching the Gains from Fertilization;" Rex F. Nielson, "Phosphorus and Potash Status of Utah Soils Are Shown by Plant and Soil Analysis;" R. L. Smith, "Minor Element Status of Utah Soils;" Dwight D. Smith, "Recent Developments in Rainfall-Erosion Research;" and Louis A. Jensen, "Our Corn Production Potential."

UREA PRICED F.O.B.

Effective July 1, all agricultural and industrial grades of urea will be priced F.O.B. production points rather than on a delivered price basis, reports Malcolm E. Hunter, sales vice president for Allied Chemical's Nitrogen Div.

Hunter said the change in pricing policy would improve the division's marketing services to customers.

F.O.B. points will be South Point, Ohio and La Platte, Neb. All grades of Arcadian urea fertilizer will be priced at $98 a ton; Procadian urea feed mixture at $100 per ton, and industrial grades crystal urea and uncoated pelleted urea at $100 per ton. Delivered cost will be equalized against competitive producting plants.

NEW TANK FARM

In June, Hubbard-Hall Chemical Co. put into operation a new bulk tank farm at Waterbury, Conn. Capacity of the 27 tanks exceed 100,000 gallons.

NORTH AMERICAN POTASH DELIVERIES DOWN, OTHER EXPORTS UP 104%

Deliveries of potash for agriculture in the U. S., Canada, Cuba, Puerto Rico and Hawaii by eight principle American producers totaled 860,759 tons of salts containing an equivalent of 499,593 tons K_2O during the first three months of 1960, according to the American Potash Institute. This was a decrease of 4 per cent in salts and K_2O under the same period in 1959.

Continental United States took 474,666 tons K_2O, Canada 18,106 tons, Cuba 1737 tons, Puerto Rico 722 tons and Hawaii 4,362 tons K_2O.

Exports to other countries were 121,241 tons K_2O, an increase of 104 per cent.

Deliveries of potash for non-agricultural purposes increased 6 per cent over last year, amounting to 38,386 tons K_2O.

Total deliveries were 1,123,342 tons of salts containing an equivalent of 659,220 tons K_2O, a 6 per cent increase in salts and K_2O over the first quarter of 1959.

"You tote the money... I'll carry the goods!"

"And we'll both do a perfect job... thanks to the Chase Standards Laboratory!" Chase buys many of its bagmaking materials on the open market...and has "the pick of the crop!" Materials must measure up to stringent tests. Result: whatever your product—and whatever the economics of packaging it—there's a Chase bag of maximum strength to do the job with unusual economy. Attractiveness is part of every Chase package, too—thanks to unique printing skills, experience and facilities. Call the Chase Man in your area—or write us for full information about your packaging requirements.

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355 Lexington Avenue – New York 17, N. Y.
32 plants and sales offices coast to coast

MULTIWALLS • TEXTILE • PLASTIC AND LAMINATED BAGS • CONSUMER-SIZE PAPER BAGS AND OTHER PACKAGING MATERIALS

LETTERS

F
C

"WET PROCESS" ACID

Menlo Park, Calif.

Please send a reprint of the article "Wet Process Phosphoric Acid in Liquid Fertilizers (F. M. Batson) which appeared in v. 122, December 1959, pp. 36, 37. Thank you.

SHIRLEY KEITH
Librarian
Chemical Economics Handbook
STANFORD RESEARCH
INSTITUTE

Landskrona, Sweden

In number 3 on page 58 of FARM CHEMICALS this year there was a notice on compacting fertilizer salts, which is of interest to us. Can you please supply us the address of the manufacturer of the described machinery.

Very truly yours,
SVEN-ERIC DAHLGREN
AB FÖRENADE
SUPERFOSFATFABRIKER

The manufacturer is Allis Chalmers Mfg. Corp., Milwaukee 1, Wis.

CONSTRUCTIVE CRITIC

POTSDAM, N. Y.

PLEASE SEND 60 REPRINTS OF "HOW TO BE A CONSTRUCTIVE CRITIC OF YOUR PRESENT MARKETING PROGRAM" PURCHASE ORDER WILL FOLLOW.

HARRY J. WATERS
ACTING CHAIRMAN
INDUSTRIAL DISTRIBUTION DEPT.
CLARKSON COLLEGE OF TECHNOLOGY

NOW YOU CAN OBTAIN
FC REPRINTS

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How Mkt. Research Can Work for You
- ☐ Part I—Comparing activities of 2 brands in one area
- ☐ Part II—Examining one product in 2 different areas
- ☐ Part III—Your Herbicide Customer

Successful Selling Series:
- ☐ Secrets of Persuasion
- ☐ 14 Ways to Definite Decisions
- ☐ Convince Your Prospect
- ☐ 18 Telephone Shortcuts
- ☐ What's In It For Me?
- ☐ Hidden Plusses
- ☐ Post Office Can Help Sell
- ☐ Pick Up New Business from Old Accounts
- ☐ Ask for the Order and Get It
- ☐ Beat the Competition . . . With Service
- ☐ Complaints into Sales
- ☐ Demonstrate with Showmanship

Salesense Series
- ☐ Sell to Dominant Buying Motive
- ☐ Knowledge makes the Difference
- ☐ Plug up the Leaks in your Sales Plan

Miscellaneous Marketing:
- ☐ Adapt Mkt. Research to Sales Planning
- ☐ Dealer Meetings that Pay
- ☐ Publicity that Sells
- ☐ Exhibits Build Brand Names
- ☐ Motivate Salesmen
- ☐ Merchandising Fertilizer
- ☐ Muscle In Your Marketing
- ☐ Farm Chemicals—Coming Into Their Own
- ☐ Clean Up Your Communications
- ☐ Fertilizer Consumption Since '45
- ☐ How to Figure Sales Potential
- ☐ Is Your Promotion Effective?
- ☐ Be a Constructive Critic of Your Present Marketing Program
- ☐ Build Sales Through Successful Farmer Meetings
- ☐ What Is A Fair Price?
- ☐ Creative Pricing
- ☐ Four Steps to Good Sales Meetings
- ☐ Obstacles to Marketing
- ☐ Cash Flow Chart can ease the Credit Strain

Reprints 50 cents per copy; bulk price on request.

Enclosed is my check for $...

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Title.....

Address.....

City.....Zone...State.....

Send to: Farm Chemicals • 317 N. Broad St., Philadelphia 7, Pa.

DBM . . . "EXCELLENT"

New York City

You are running some excellent articles on selling, and the one on the Dominant Buying Motive (in your May issue, page 14) is outstanding . . .

Sincerely yours,
GORDON D. RAPP
WILDRICK & MILLER

Palo Alto, Calif.

Please forward to our office a copy of "Hidden Plusses in Your Product." Fifty cents is enclosed. Thank you.

Very truly yours,
CLYDE S. COOK
Vice President
ALDUS ENTERPRISES, INC.

IMPORTANCE OF MR

Atlanta, Georgia

Please send us a copy of the following publication: "Marketing Research and Its Importance to Farm Chemicals Manufacturers," April 1960. Enclosed is 50 cents in coin to cover the charge for this item.

Thank you very much.
Yours very truly,
ROBERT L. BOWEN
Mkt. Research and Development Dept.
TENNESSEE CORPORATION

Ithaca, N. Y.

Could you please send me one reprint of the article entitled "Marketing Research and Its Importance to Farm Chemicals Manufacturers" which appeared in the April, 1960, issue of FARM CHEMICALS.

Enclosed is 50 cents in cash to cover the cost. Thank you.

Sincerely,
ROBERT B. CHILD
Market Research Manager
COOPERATIVE G.L.F.
EXCHANGE

A-W NAMED SALES AGENTS FOR HOUSTON SLUDGE

George W. McCarty, chairman of Ashcraft-Wilkinson Co., has announced that his company has been named exclusive sales agent for Hou-Actinite.

A five-year contract was awarded to Ashcraft-Wilkinson by the City of Houston, Dept. of Public Works.

Sales will be concentrated in Texas and surrounding states, McCarty said, with a majority of the product going to fertilizer mixers and manufacturers.

NEW V-C SALES MANAGER

John L. French, a fertilizer salesman and manager for more than 30 years, has been named general sales manager for the Fertilizer Div. at Virginia-Carolina Chemical Corp.

Johnny Unitas demonstrates newest H&W high strength-packaging paper . . .

EXPANDA-KRAFT

THE GREAT NEW NAME IN EXTENSIBLE KRAFT

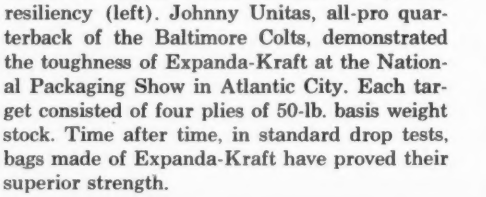
THIS AD IS PRINTED ON EXPANDA-KRAFT WHITE

You can also buy Expanda-Kraft
in Semi-Bleached or Natural. Imagine how attractive *your product*
would look, packaged in Expanda-Kraft.
To learn how well your product can be *protected* by Expanda-Kraft, see other side . . .

EXPANDA-KRAFT

DEFIES SHOCK!

The bullet passes of Johnny Unitas have the terrific impact to rip through regular kraft (above), yet, thrown at the same speed, they bounce off Expanda-Kraft because of its greater resiliency (left). Johnny Unitas, all-pro quarterback of the Baltimore Colts, demonstrated the toughness of Expanda-Kraft at the National Packaging Show in Atlantic City. Each target consisted of four plies of 50-lb. basis weight stock. Time after time, in standard drop tests, bags made of Expanda-Kraft have proved their superior strength.



Expanda-Kraft is the winner in impact test against regular kraft. Bags of each type were filled with sand, suspended on long ropes, sent hurtling toward each other. Regular kraft bag, photographed at high-speed as it burst, had same ply construction as Expanda-Kraft bag.

EXPANDA-KRAFT REDUCES BREAKAGE It has *two-way stretch,* soaks up shocks that would break ordinary kraft of equal basis weight.

EXPANDA-KRAFT WITHSTANDS MOISTURE *High humidity* and *weathering* have little effect on Expanda-Kraft! It retains its full toughness and firmness.

EXPANDA-KRAFT PRINTS SHARP This advertisement is printed on 50-lb. Expanda-Kraft White from a regular production run. Other shades print as well to enhance sales appeal.

EXPANDA-KRAFT BAGS STACK SECURELY They have a coefficient of friction higher than regular kraft bags, stack with less risk of slippage, stay in place while in transit.

EXPANDA-KRAFT BAGS FILL FAST They meet required porosity standards, yet are rigid enough to stand up to high speeds on the filling line.

CONTACT YOUR MULTIWALL BAG SUPPLIER for information on the use of Expanda-Kraft where rigidity, resilience, strength, moisture resistance and uniformity are required. Expanda-Kraft is made by a new roll-crepe process and is available to multiwall bag manufacturers in 40, 50, 60, 70 and 80-lb. basis weights; White, Semi-bleached or Natural. *Hollingsworth & Whitney, Division of Scott Paper Company, Dept. G, Chester, Pa.*

HOLLINGSWORTH & WHITNEY DIVISION OF
SCOTT PAPER COMPANY

WASHINGTON VIEWPOINT

F C

▸ *Impact of the Cold War on industry's overseas markets and its basic effect on the American internal economy can no longer be ignored.*

▸ *If a new wheat law comes, you can expect major adjustment in many wheat areas.*

Observations on cold war. This month we take time out to make some observations on the great pressures building up on this country through the intensified Cold War. Impact of the Cold War can no longer be ignored as to either its effect on industry's overseas markets or its basic effect on the American internal economy. Spy-plane and Japanese incidents are bumps in the trend-line of the Cold War, and should *not fuzz the basic Cold War issue which is trade.*

"Agribusiness"—which is the sum total of those industries involved in the production and marketing of U. S. food and fiber—is heading toward a hectic period of agonizing readjustment as a result of the intensified cold war and related developments. Actually, the related and other developments are perhaps more important than the cold war in bringing on readjustments in the total agribusiness complex—but the cold war has a big impact on current trends and must be considered in the total picture. As a result of these over-all trends, there is no doubt that agribusiness industries, including fertilizer and pesticide industries, will be doing a lot of things differently in the years ahead.

Cold War is expected to be with us for at least 10 years, according to the best current judgment. Because of this, businessmen must integrate the fact of its existence into their planning—another dimension to be added to the American business mind. Unless it is accepted as a fact of life, business leaders (as well as political leaders) are in danger of falling victims of "cold war tension." This shows up in at least two tendencies: (1) To make hair-trigger decisions whenever a new crisis pops—being caught off balance and never being fully prepared to take a new crisis in hand. An example of how this works came on the spy plane incident, when Washington fibbed about its purpose at first, and then came clean—and opposition politicians added further embarrassment by popping off all over the lot. (2) To become so alarmed that we are mentally stymied from taking any action. An example of this shows up in our military installations abroad where many commanders now are holding back from conducting normal, routine maneuvers.

Where is the cold war going? There are enough trends in sight now to give us a good idea—and the news isn't particularly good.

After 20 years or more of dominating world trade, the U. S. has been backed down by stiffer competition. We now import more than we export. From now on, U. S. industry will have to fight to sell abroad—and do it through price. This is not temporary—and the expectation is that it will get worse before it gets better.

As the Russian sphere of influence spreads, it means the U. S. has a smaller chance to make favorable agreements. Prediction: You can expect other free nations ringing Russia in which we have military bases to follow the path now being taken by Japan. They look at us as "warlike"; want no part of it and want to become neutral. Where Russia trades with other countries, such as Cuba, the U. S. will lose further export opportunities.

But it's not only Russian competition which hacks away at our trade position. Times are changing generally throughout the world. Small nations are banding together to give each other favored treatment —and the U. S. the cold shoulder. Example: The 6-nation European Common Market, the Outer Six, and so on. And, sleeping giants are waking up: Africa, for instance, and China is yet to be heard from.

What does it all add up to? First of all—cutting through the details—experts see in the years immediately ahead a flood of foreign goods coming into this country. The U. S. will have to make import concessions in order to promote exports. We've got foreign cars—what about foreign tractors and equipment? Much of American business will have to retool to meet the competition—just as the automobile industry has been forced to.

These, and other, questions become more than merely academic exercises:

Will the American business concept of an even brighter tomorrow fade out of the picture?

Does it mean we're heading toward a levelling off in the Gross National Product?

And what does it mean to our rising standard of living? Will the cold war put a ceiling on that?

Hard thinkers say the answer is NO to these questions—but many serious-minded people are very much concerned.

And what does it mean to industry of the agribusiness complex? The cold war is an added pressure —added to low farm prices, surpluses, technology, etc. It helps push agriculture along the road to bigness—bigness being by far the most significant development in agriculture today.

The cold war and the established trends it intensifies will make for certain re-adjustment in farming, businesses selling the farm market, and industries buying from farmers.

For agriculture, it means: A serious threat to farm exports, and a possible backing-up of greater surpluses in this country. If so, production controls of some kind loom as a bigger possibility. It also would mean loss of income to farmers. On the other hand, it

"H-25 PAYLOADER® delivers 25% more, increases operator comfort and safety"*

*Mr. J. B. Evans, partner of Evans, Reed and Williams at Sylvania, Georgia, says, *"The new H-25 'PAYLOADER' is moving better than 25% more material than the previous model HA. The smooth operation assures cleaner working floor conditions, faster delivery, plus operator comfort and safety. It's giving all-around satisfactory service. Our original model HA gave exceptionally good service for 9 years and our larger model HAH operated six years before it had a major overhaul."*

There are many reasons why the Model H-25 will dig, carry and deliver more tonnage with lower operating and maintenance costs than anything near its size. One is the power-shift transmission — exclusive in its class — with two speeds forward *and* reverse. Others are the power steer; power-transfer differential; 4,500 lbs. breakout force; 2,500 lb. carry capacity; shortest turning radius of only 6 ft.

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WASHINGTON VIEWPOINT

increases the necessity for cutting costs of farm units of production to permit farm competition in world markets.

For business selling the farm market: It means stiffer competition for the farm dollar—both from imported materials and equipment, and from concentration of farm buying power in fewer hands. For these industries it means finding new ways of selling: Perhaps leasing of equipment, changes in plant locations, revisions in dealer set-ups, etc. Make no mistake that Big Agriculture will become an even bigger challenge for those competing for the farm dollar. Current trends are rapidly becoming clear—and many companies already are gearing to meet the challenges.

For business buying from farmers: It probably means continuing low cost farm products and an abundance of them. We do not expect the government to artificially raise these costs significantly—regardless of administration running the government.

More competition, lower profit margins. This is the prospect confronting this industry and many others, according to many Washington experts intimately acquainted with the economic aspects of the Cold War. It intensifies many of the basic trends already underway—and very likely will speed them up. As one expert puts it: "Industries who do not take a realistic attitude toward what's going on abroad in relation to their domestic (as well as export) business, may find themselves drying up within the next 10 years."

Prospect for wheat legislation this year was still touch-and-go at press time, but the answer will be in by July 9 when Congress must quit in order to permit the first political convention to get started. We have had the feeling that Congress would change the law in time for 1961-crop plantings which start in winter wheat areas this fall. We still feel that way, although time is running out.

If a new wheat law comes you can expect a major adjustment in many wheat areas. Most farmers would begin curtailing production, which in turn would mean less spending on the things needed for wheat production. The effect would be especially hard on rural businesses catering to wheat farmers.

If a wheat bill is enacted into law this year, it will follow closely to the version approved by the Senate. That is, a reduction of 11 million acres in plantings for 1961—from the current national wheat allotment of 55 million acres. Price support would be held at the current 75% of parity, about $1.78 a bushel. To make up for some of the loss in income farmers would take from harvesting fewer acres, the government would give them surplus wheat equalling about half of the wheat they could have harvested if they had been permitted to keep reduced acres in production. Actually, this payment-in-kind gimmick would maintain wheat income close to current levels—but because of less production wheat growers would spend less for wheat production items.

What's Coming Next Month

We were delighted to see the National Plant Food Institute bring together several outstanding authorities on *fertilizer selling* at their convention at the Greenbrier last month. It's encouraging to see the industry giving attention to a problem which FARM CHEMICALS has pin-pointed as *the* problem in the Soaring Sixties.

We predict that in the coming months, you're going to see a lot more action in the form of sales training sessions. It's evident that an awakening is taking place.

Listening to Ralph E. Everett expound on the subject, "Sell a Mental Concept," a FARM CHEMICALS reader told us, "Listen to that guy, will you? He's telling *your* story!" True, but Ralph is no stranger to FARM CHEMICALS readers. He was the author of "Filmstrip Ups Farm Chemicals Sales" last year in our July issue.

■ SELL A PROGRAM

How can a soil fertility plan be broken down into steps which can be easily explained in terms of what motivates the farmer? Ralph Everett will explain the four fundamental steps. Also, he'll show you how to develop a program for the farmer's entire career—rather than just one crop year.

■ BUDGET YOUR TIME

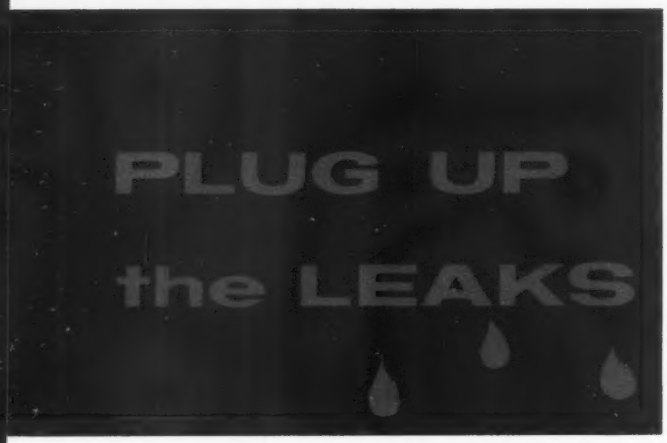
Time is the most important thing a salesman owns. Wouldn't it be wise to budget that time in order to realize the most profitable sales from it? The author of our Salesense series will show you how the top salesmen manage their most important asset.

■ CREDIT SERIES ROLLS ALONG

The fourth in our series on credit will deal with "Reaching the Middle Market"—the 60 per cent that the industry is currently missing with a sound credit program.

. . . in the new

FARM CHEMICALS BPA



in your sales plan

By O. C. MERRETT

In the third article in FC's "Salesense" series, let's talk about what an organized sales plan will mean to you. Your presentation should be organized so that the farmer will want your products more than you want to sell them.

Have you ever tried to fill a water trough with a bucket that leaks? If you have, then you know you have to make more trips and run faster than you would if your bucket didn't have a hole in it. Similarly, a salesman with a leaky, disorganized presentation has to see more prospects and run faster between them to fill his quota trough than the man with a leak-proof, well organized sales plan.

A sales book titled, A Modern Course in Salesmanship, *by James S. Knox and John Knox that we recommend in our course says: "A sales presentation has just one purpose . . . it is to get a favorable response from a prospect. Securing favorable attention is absolutely essential. To get immediate favorable attention, you must build your sales presentation so as to appeal strongly to some self-interest motive or motives in your prospect. Your sales presentation should be fashioned like a woodsman's wedge. It should be very sharp at the point of contact and capable of cutting through every difficulty in order to gain a final favorable decision."*

A sales plan full of leaks will not gain for you a favorable response from your prospect, nor will it gain for you a final favorable decision.

IF YOU are complacent . . . self-satisfied . . . lazy . . . *don't read this article!* This article is written for the sales person who wants to see more prospects, give more interviews, sell more merchandise and make more money. In the substance of this article and next month's article lies the difference between the order-taker and the hard-hitting professional.

While working on this article, I asked three friends who are presidents of their companies and who do most of the buying, to let me visit with each of them the day they did most of their buying.

This is what I heard with my own ears and saw with my own eyes . . . One salesman had to make three trips to his automobile for parts of his demonstration. One had to call his office four times for information. One salesman was asked why he should change suppliers, and he answered, "Because we are the largest company"!

Of the 18 salesmen I watched, only three had planned their presentations. There were only two sales closed. Five of the 18 asked for the order. Two had to borrow pencils. Eight started their pitch by use of their price sheets. Only two placed their order pads on the buyer's desk the minute they started their presentations—*and, by the way, they were the two who got the orders.*

I believe the best planned sales presentation I have ever heard was given by a young man to the president of a bank. This young businessman asked me to listen to his presentation before he made it to the bank president. He was going into business for himself and needed capital. He knew he didn't have enough security for the loan, so he had to sell himself.

He started off by showing the potential of his new business. Then he presented a chart showing his sales record for the past 11 years . . . how he had taken run-down territories and put them on top. He presented facts proving he would be the only competitor his old company had. He had letters from several of his

customers, stating they would gladly give him their business. He presented a chart showing the goal he had set for his new company . . . the first year, the the second year, and the third year.

He closed his presentation by pointing out to the bank president that he would do all his banking with his bank. He got the loan. The reason he got the loan was that he had done his homework. He was prepared . . . he had anticipated every objection and question the bank president asked him and answered them intelligently.

BUYER'S DECISIONS

A prospect must make a total of five decisions in order to become a customer for the farm chemicals salesman. These are as follows:

1) I will see the salesman.
2) I will listen to the salesman.
3) I now recognize the disadvantages of my present farming position.
4) I see where this salesman's fertilizer can overcome these disadvantages.
5) I should act now.

Maybe you are thinking, "That's right, he must make these decisions, but how do I get him to make them?" It will become easy if you use these steps:

1) Have a compelling attention getter.
2) Arouse his interest.
3) Ask questions that will point out his loss or disadvantages.
4) Give him enough facts and benefits about your fertilizer to convince him he would be justified in buying it.
5) Motivate him to take action by pointing out his need . . . turning his need into desire . . . desire into want . . . *want* into *urgent necessity.*
6) Ask for the order.

No rule of selling is of any value to a fertilizer salesman unless he uses it! Or makes its use habitual!

Before we use any type of selling rule, step or plan, let's be sure we know the meaning of each. For instance, a Unit of Conviction is a part of your conviction step.

How many units of conviction should you use? That depends upon you and your prospect.

I suppose the one question I am asked by salesmen the most is: "How many questions should a salesman ask in an interview?" The answer to this question also depends upon the type answers you get from your prospect. Most top salesmen ask lots of questions. However, too many questions not properly phrased can cost you sales. When asking questions, remember:

1) When you ask your prospect a question, listen to his answers, and listen enthusiastically.
2) Acknowledge his answers by saying something other than, "uh huh". If you have ever been examined by a physician for a check-up, you'll know what I mean. The doctor starts to check you over by taking your pulse, and he says, "uh huh! Om hum." Then he checks your heart beat, and says, "Uh huh . . ." By this time you are going NUTS. You don't know whether you have low blood pressure, high blood pressure, weak heart beat or strong heart beat. . . . Your prospect gets the same feeling.
3) Don't give your prospect the "3rd degree".

You might try the following for a starter:

1) "That's interesting, Mr. Farmer. Now let me ask you this . . ." Important notice . . . *Never* ask your prospect to let you ask him a few questions. He doesn't like this . . . he gets the feeling you are going to get nosey. Instead try this: "Mr. Farmer, that's sure important. Now let me ask you this . . ." Then ask him.

We all like to be asked questions if they are asked right. It gives us a feeling of importance . . . so ask, but *ask right.*

A SALESENSE SANDWICH

Now let's look at a Unit of Conviction. In the O. C. Merrett and Associates Training Institute, we call a Unit of Conviction a Salesense Sandwich.

1) Fact: That which a thing is.
2) Link: Spotlights the Benefit. Sells the coming attraction.
3) Benefit: A promise of what your product or service will do for or mean to your prospect.
4) Evidence: Some type of proof that your product or service will do what you say it will do.
5) Commitment: An agreement from your prospect that he has bought this one unit only. If we will remember this . . . "If a selling point is worth giving . . . ask for a commitment" . . . your sales will increase. This I will guarantee!

When should I ask for the order? How often should I ask for the order? How many times should I ask for the order? These three questions are asked without fail in the first session of every class we instruct.

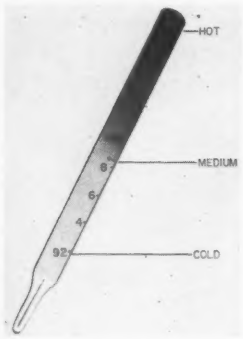
We realize an answer given to any of the three can and will start a controversy. Some sales executives say ask early, ask often; others say to start closing the minute you start your presentation. Still others say just be sure you ask. I am sure you will agree that any one of the three answers could be right. However, we believe it depends on what you are selling. The more your product sells for, the more time you should spend on your presentation. The brush salesman cer-

PLUG UP the LEAKS

tainly would not spend as much time giving his presentation as the heavy equipment salesman.

Take your prospect's temperature . . . You do this with your commitment questions.

We have all, at some time, had a nurse or doctor put a thermometer in our mouth to see whether or not we had a fever. The fertilizer salesman should do the same thing with his prospect. After each selling point or unit of conviction, he should take the temperature of his prospect by asking for a commitment. If the salesman gets a hot temperature reading, he should use a trial close. If the prospect's reading is cold or medium, he is wasting words asking for a close. He needs to give his prospect more benefits.



I am convinced that the chemical fertilizer salesman calling on a new account should not stop his planned presentation and ask for the order until he has presented and demonstrated every benefit he had planned to present, with two exceptions.

1) If he gets a hot temperature reading.
2) If he notices a hot buying sign or signal.

Notice I said *planned presentation.* Unfortunately, too few of today's salesmen really plan their sales.

SALESENSE PLAN

One farm chemicals salesman I know uses the following outline and tells me he closes 90 per cent of the interviews he makes:

1. Attention . . . tied to prospect's dominant buying motive.
2. Link from attention to interest. For example:
   a) "Mr. Prospect, in order for me to show you in specific detail how we can best serve you, let me ask you this . . ."
3. Arouse interest . . . tied to D.B.M.
4. Qualifying questions . . . at least six that are pertinent.
5. Link from interest to first unit of conviction. Some examples are:
   a) "Now let me show you how . . ."
   b) "Let's look at some of the ways your problem will be eliminated."
   c) "Now, here's how this will solve your problem."
   d) "Now let's look at some of the ways we can eliminate your worries and give you

The PROFESSIONAL salesman's plan

Who Are You Going To Sell?

1. Have you done a thorough research?
2. Who are you going to call on?
3. What is his name? How does he pronounce it? What is his title?
4. Can he make a firm decision?
5. Who are your competitors?
6. What are your advantage points over your competitor's?
7. Are you convinced there is a need?
8. If you were the prospect, would you buy?
9. What is his primary interest?
10. What are his Buying Motives?
11. Have you anticipated his objections?
12. Are you answering objections before they come up?
13. Do you know his company? Is it growing, standing still or fading?
14. Who are company competitors? Is company strong financially?
15. What is Marketing Concept, Range?
16. Know his sales force caliber.
17. Is he a good promoter? Does he believe in advertising? How does he advertise?
18. Do you know the size of his budget?
19. What kind of buyer is he—Clam, Argumentative, Talkative, Self-important, Friendly, Suspicious, Slow thinker, Fast thinker, Price minded, Poor Listener?
20. What is his secretary's name?
21. What is the best time to see him?
22. Do you have everything you will need—Demonstration, evidence letters, visual aids?
23. Do you know everything there is to know about your product or service?
24. Do you know his credit rating?

How Are You Going To Get His Attention? (Write it Down.)

1. What are you going to help him buy?
2. What buying motive are you going to appeal to?
3. Is your attention getter strong enough to overcome: "I am too busy," "I'm not interested," "I am not seeing any salesmen today," "Don't need anything," "I'm satisfied."
4. How will he use it—for business—for pleasure?
5. Are you ready for "What does it cost?" What are you going to say?

Arouse Interest (Write it Down.)

1. What are you going to say?
2. Are you going to fix problem?
3. Are you going to point out or create a need?
4. Is your interest creator pertinent to Buying Motive?
5. Will it cause prospect to say: "Sit down. I want to hear more"?

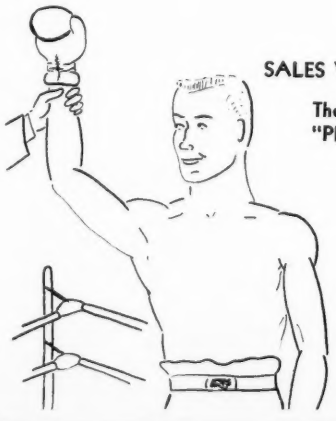
Conviction (Write it Down.)

1. How are you going to create dissatisfaction without slapping him in face; without tearing down what he already owns?
2. Are you going to point out the improvements?
3. Are you going to point out new uses?
4. Are you going to point out his losses by not using?
5. Are you going to offer a solution?
6. Can you prove you have the solution?
7. How are you going to prove you have the solution?

peace of mind."

6. Unit of Conviction No. 1
   a) Fact
   b) Link
   c) Benefit
   d) Commitment
7. Links from fact to benefit.
   a) "Here's how that is going to save you money."
   b) "Now, here is what this will do for your corn . . ." (or any crop or item the prospect has).
   c) "Now, here's why ———— exactly fits your need."
   d) "Now, here's what that is going to mean to you . . ."
   e) "Now, here's how you are going to save labor, time and money."
8. Link from No. 1 to No. 2 Unit of Conviction
   a) "Another unique feature about———— is . . ."
   b) "Another time-saving benefit is . . ."
   c) "Mr. Farmer, another exclusive feature you will receive when you start using your new———————— is . . ."
9. Unit of Conviction No. 2
   a) Fact
   b) Link
   c) Benefit
   d) Supporting evidence (example type)
   e) Commitment
10. Link from Unit of Conviction No. 2 to Unit of Conviction No. 3
    a) "Let's examine some of the ways you will save labor and money by using————"
    b) "Now let's see why I say this . . ."
    c) "Mr. Farmer, in addition to all other benefits you will receive when you start using ————————, listen to this . . ."
11. Unit of Conviction No. 3
    a) Fact
    b) Link
    c) Exclusive benefit
    d) Supporting evidence (demonstration type)
    e) Motivational benefit
    f) Commitment
12. Trial Close No. 1
13. Prospect's refusal
14. "Obviously, Mr. Farmer, you have a reason for not approving this plan. Would you mind my asking what it is?"
15. Prospect states objection.
16. Pad the objection with, "I understand." Then turn objection into question. Get commitment that he understands it to be a question. Answer his question; ask for a commitment that his

8. Are you ready for under-rock objections?
9. Are you ready for product test objections?
10. Do you plan to take the prospect's temperature?
11. Do you have several trial closes prepared?
12. Are you prepared to detect all buying signs and signals?
13. What questions will you ask? Are you going to let him talk?
14. Are you ready for price?
15. Is evidence outlined and in order?
16. Are you driving toward close?
17. Are you going to nail down units?
18. Will you understate?
19. Will you put price between two big fat benefits?
20. Do you have comparison sentences and analogies ready?
21. Are you going to talk benefits, instead of price, fact and deals?
22. Are you linking to Buying Motive?



SALES WINNER . . .

The "PRO"

23. Will you ask for his opinion or will you give yours?
24. Have you eliminated all trite words and word whiskers?
25. Will you summarize all units?

Desire (Write it Down.)

1. Are you prepared to turn his need into desire, his desire into want, his want into urgent necessity?
2. Which buying motives are you going to appeal to?
3. Which of the five senses are you going to appeal to?
4. Are you going to use word pictures?
5. Are you prepared to use the three selling languages?
6. Are you prepared for: "I want to think it over;" "Leave your literature;" "I will have to talk it over with————;" "I will call you;" "You caught me at a bad time;" "I will have to see my banker?"

Do You Have Your Closes Prepared? (Write it Down.)

1. My first close.
2. My second close.
3. My third close.
4. My fourth close.
5. My fifth close.
6. Are your closes tied to his buying motive?
7. Will you take advantage of previous objections and capitalize on them?
8. Will you help him decide?
9. Will you make it easy for him to buy?
10. Will you let him close on minor decision?
11. Will you ask for the order?

Reassure

1. Will you thank him or will you reassure him?
2. How will you reassure him?
3. Are you going to buy it back?

PLUG UP the LEAKS

question was answered. Go into next unit of conviction.

17. Unit of Conviction No. 4. (Reverse procedure by putting benefit before fact.)
    a) Benefit
    b) Link
    c) Fact
    d) Supporting evidence (visual aid type)
    e) Motivational benefit
    f) Commitment
18. Trial Close No. 2 (minor point).
19. Prospect still refuses to close . . . uses an objection.
20. Capitalize upon objection. Example: "You know, Mr. Farmer, that just might be the reason you should buy now."
21. Get commitment in your favor; then start back selling, by going into Unit of Conviction No. 5.
22. Unit of Conviction No. 5.
    a) Fact
    b) Link
    c) Benefit . . . benefit . . . benefit
    d) S. pporting evidence (narrative type)
    e) Commitment

WHEN HE ASKS THE PRICE

23. Prospect asks price.
24. Salesman explains difference between price and cost by using an analogy.
25. Salesman quotes price, but places it between two big, fat benefits.
26. Prospect says price seems a little high.
27. Salesman admits product is a little more expensive . . . then explains why.
28. Salesman paints a word picture of the prospect's using the fertilizer now and the benefits he is now receiving.
29. Summary.
    a) Summarize prospect's reasons for not buying now, and the reasons why he should buy now.
30. Link from word picture to summary close. Example: "Mr. Prospect, in a minute you're going to make a decision, and before you make your decision, let's consider the reasons that might cause you to hestitate, and the reasons for starting our fertilizer program now:"

Reasons for Hesitation	*Reasons for Starting Program Now*
1)	1)
2)	2)
2)	3)
4)	4)
5)	5)
	6)
	7)
	8)
	9)
	10)

31. After summary sum-up, say to your prospect, "Mr. Farmer, which would you say outweighs the other . . . the reasons for hesitating or the reasons for starting our fertilizer program now?"
32. If you have handled your summary close right, he will most likely say, "The reasons for starting the program now."
33. Ask for the order by giving him a choice between something and something. For example:
    a) "Mr. Farmer, which farm would you like for us to deliver this to . . . your No. 1 or your No. 2?"
    b) "Mr. Farmer, when would you like for us to deliver this . . . this afternoon at 3:00, or would in the morning suit you better?"
34. Reassure prospect he has made a wise decision. (This avoids canceled orders.)

A THIRD SALES PLAN

A sales executive whose salesmen sell 15 different lines and floor covering materials stresses the following sales plan. He told me the men who follow this plan religiously have increased their sales some 37 per cent.

Name of company to be called on	Type of Business
Name of person or persons to contact—Titles	Has anyone from my company called on company before? If so, why didn't he buy?
Name of competitors	Purpose of this call
Are you convinced there is a need?	Buying motives are:
Type of Buyer	Secretary's name
How are you going to get his attention? What are you going to say?	How are you going to convert into interest? What are you going to say? What are you going to use?
List questions you intend to ask:	List needs:
How are you going to dissatisfy him?	How are you going to solve his problem?
List all the benefits you are going to present. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12.	List types of proof you will need to prove your promises. 1. Testimonial letters 2. Ads 3. Photographs 4. 5. 6. 7. 8. 9. 10. 11. 12.
List all the objections you can anticipate.	List three answers to each objection.
Condition him for desire.	Write out word picture you are going to use.
List at least five different closes.	How are you going to reassure?

In this article, we have presented three tried, tested and proved sales producing plans. So if you want to increase your fertilizer sales . . . sell more applicators and related items . . . increase your earnings . . . have more time for longer vacations . . . *DO YOUR HOME WORK.* Plan your sales presentation . . . Not *CANNED . . . PLANNED!* ▲

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Sohiogen 4531
Sohiogen 4537
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Urea — Ammonium Nitrate — Ammonia Solutions

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Sohiogen 4320
Sohiogen 4422
Sohiogen 4425
Sohiogen 4428
Sohiogen 4933
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22-60

Disorganization

In the first article of this series, the cash flow chart was used to point out the huge difficulty facing the man who is selling to the farmer—the tremendous amount of credit (in proportion to sales) that is needed for a short period of time. This chart illustrates, better than any other device, one of the major problems in the sale of farm chemicals.

THE lack of organized financial information and planning is another major problem in the farm chemicals field. This lack of modernization of thinking in terms of agricultural needs can literally stop farm chemicals in their tracks. The industry will soon be too large to operate on cash sales. No other industry as large as the agricultural industry would even attempt to operate on its own cash. It would incorporate to gain initial capital, and then use banks or other lending agencies for more money. Selling billions of dollars worth of products on a strict cash basis is impossible.

Just what is a cash sale and what is a credit sale? To use a simple illustration:

Suppose that I enter your dealer's place of business, and ask him for a hundred pounds of seed corn. Then when the time comes to pay I find that I don't have any money left in my pocket. So, I tell your dealer that I will be in tomorrow and pay him. That is a credit sale. Even if he loads up my car and I come back and pay him in ten minutes, this is a credit sale. The only real cash sale is what is known as "cash on the barrel head." My cash and your merchandise are in sight.

WHY ISSUE CREDIT?

Let's examine the reasons why he might allow me to get the seed corn for credit. There are, essentially, three considerations that he should have in mind:

1. My past record of paying my bills
2. My present capacity to pay my bills
3. My character as known by your dealer

The most important of these is my past record of performance. In fact that, plus my present capacity, should be required for issuance of credit.

Most of us live by and on credit. The men who work for you in your plant trust your credit. They work for a week, two weeks, or a month without pay. They expect you to honor your obligation at the pay table.

Almost all orders to suppliers are on credit. Your dealers send in an order; after it is sent you send an invoice with your terms which might be 2/10:n/30. In any case this is credit. Many times in a highly seasonal business the plant will ship enough money-value in merchandise that if just once everybody failed to pay their bills, the plant would be broke.

All early shipments out of season, for payment in season, are credit. Credit is not a dirty word. It is not something that down-and-outers, the careless, or the unthrifty, alone use. Credit is essential to any large scale movement of merchandise.

RECORD OF PAST PERFORMANCE

There is one thing that makes credit a useful tool. That thing is written record of the past performance of the person asking for credit and a statement of his present capacity to pay. In the early history of the country, manufacturers wishing to ship to the far west desperately needed the services of Dun and Bradstreet.

Without these services a manufacturer in New York would not have dared to ship merchandise west. It would have been only too possible for the buyer to re-sell the merchandise and skip.

Today's retail credit to consumers is possible only because of the tremendous records and files maintained by the Retail Credit Bureaus. These records constitute the past performance of the individual in so far as paying his bills is concerned.

This brings us squarely to the problem facing the Farm Chemical Industry. There is no record of the past performance of a farmer's payment of bills. There is seldom a balance sheet available to show the farmer's present capacity to pay. This lack of records is hard to understand. It could be justified if the farmer were a consumer only. Then the Retail Credit Bu-

Another major problem in the farm chemicals "credit mess" is lack of organized financial information and planning. A complete overhaul is needed and the farmer will have to learn the "financial facts of life." . . . By F. E. HARTZLER

reau's file would be adequate. But he is not just a consumer. He is a business man with a substantial stake in money, land and buildings. There are billions of dollars involved here. An annual market of this tremendous size cannot hope to operate on cash. Yet there is no pattern by which to organize this market to raise money. If there is to be some sort of organized credit made available in large amounts at the time needed then the first thing is going to be some sort of financial reporting.

There are three sources of capital available:

1. Dealers (who carry their own paper.)
2. Banks
3. Suppliers

None of these is too satisfactory. Dealers are usually not large enough to carry their own paper or very much of it. Banks are very conservative. They seldom move rapidly into a new area even though it may be profitable. The building and loan associations, the auto finance companies, and the small loan companies are evidence of this. The suppliers can, of course, carry some paper, but their business is not banking. They can make more money by manufacturing.

NEEDED: A FINANCIAL REPORTING METHOD

Agricultural financing can be arranged if a method of financial reporting can be secured. I am not talking about retail credit but industrial credit to an industry. This will mean that the farmer's payments will need to be reported to a central publishing house. They, in turn, will maintain a record of his previous financial transactions.

This cannot be done in ten minutes but it should be started soon. Unless an organized record of past performance is available, one simply cannot extend credit in any great amount. You will always be stuck with local sources. Unfortunately, local sources are always in the most trouble just when credit is needed the most, such as after or during a drought. At such a time the local bank is usually over-extended, yet more money is needed.

I do not have any illusions about the tremendous amount of time that this will take, nor do I have any illusions about the difficulty of getting farmers to operate with some semblance of business methods. But if large scale credit is to be granted agriculture from distant money markets, something of this nature is essential. I can clearly see many farmers shaking their heads, saying, "It ain't any of your business," and I quite agree unless and until that farmer needs money for the farm—then it is someone else's business.

This might be the greatest advantage of corporate farms. They have adequate records and can go to a financial source with a good story and borrow money. With such records they can, if they wish, escape the monopoly of the local banking institution.

If there are no records of past performance and present capacity, then any large amounts of credit must rest on illusion. The credit manager of the supplier will continue to get some sort of vague records from the bank, these records will be on a risk that the banker doesn't want. The banker himself has only a vague record of the man's capacity to pay and some sort of a past performance record, but it usually isn't up to date.

The dealer will probably continue to extend credit to people that the bank and suppliers don't want, too badly.

A mess isn't it? The primary need remains: a record of past performance and a summary of present capacity statement. Financial organizations designed specifically for agriculture, such as the home loan associations, automotive finance, and even the specialized banks, will have to be established.

LEARNING "FINANCIAL FACTS OF LIFE"

The farmer will simply have to learn the financial facts of life. Those who are too coy with their information will simply be unable to borrow money. Those who can adjust, will do so. I would estimate that, if they were to start now, within twenty-five years agricultural financing would have reached the acceptance of automobile financing. A complete overhaul, not patching is needed—after all, we are talking about billions of dollars. ▲

Paul Truitt's problem: "running out of time."

Beal of the B & B team sounds off on dealers.

Arthur H. Motley called for a "higher purpose."

Dr. Clifford M. Hardin explained college role.

Guidance for dealers, dealer characteristics survey, and selling a mental concept . . . timely topics at The Greenbrier as

NPFI looks at its SELLING EFFORT

MARKETING AND DISTRIBUTION came into prominent play during the National Plant Food Institute's fifth annual meeting at The Greenbrier, June 12–15, White Sulphur Springs, West Virginia.

"More and more attention must be given to the problems of distribution and marketing. Some of us think we know our customers well . . . that we know the market sufficiently. But the fact remains . . . we cannot take either problem area for granted," said Richard E. Bennett, outgoing chairman of the Board of Directors.

Drs. George M. Beal and Joe M. Bohlen, professors of rural sociology, Iowa State University, Ames, told the group that "in many areas the majority of farmers could be using three times their present amounts of fertilizers economically." They were joint speakers on the subject of "Dealer Characteristics Survey." "The long-run future of the fertilizer industry depends on securing optimum use of fertilizer by the farmer. Many farmers do not use any fertilizer. Probably the biggest potential is helping farmers increase their use of fertilizer to more nearly the optimum level," they said.

FURNISH DEALERS "KNOW-HOW"

"Fertilizer manufacturers have a challenging opportunity to help a dealership grow and prosper, by furnishing him know-how and by providing him with the necessary tools to operate a successful farm supply store," stated Murray C. Renick, President of Rolla Feed Mills, Inc., Rolla, Mo.

Speaking on the subject of "What a Dealer Should Know" Renick sincerely believes "that the salesmen should be trained so that they can give guidance to dealers who so desperately need help. Most salesmen are of little help to us dealers, as they are not properly trained." It is his belief "that fertilizer salesmen should be trained so that they may hold training meetings with dealers, monthly or semi-annually, to guide them in merchandising, selling, incentive plans, credit control and profit possibilities."

Ralph Everett, of Miami, Fla., well-known sales consultant, brought out at the meeting that "the leaders of the fertilizer industry during the next decade will have demonstrated and proven one simple truth—you don't sell fertilizer, you sell a mental concept of how the farmer can benefit from your soil fertility plan."

The farmer is "longing for the fertilizer salesman who can picture his problems, his investments, his ambitions, his goals in life," and salesmen who will trouble themselves to learn the processes that go on in the farmer's mind "will have a gold mine that will produce in direct proportion to the work he wants to put in."

NAME OFFICERS AND DIRECTORS

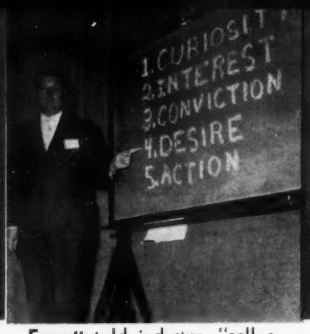
The Board of Directors of the NPFI elected J. D. Stewart, Jr., Federal Chemical Co., as chairman of the board, and John W. Hall, of PCA, as vice chairman. Other members of the Institute were elected as follows: Paul T. Truitt, president; W. R. Allstetter, vice president; Louis H. Wilson, secretary; and Wm. S. Ritnour, treasurer.

Members of the Executive Committee elected by the board are: J. C. Denton, president of Spencer Chemical Company, Kansas City, Mo.; Mr. Hall; J. J. Lanter, president of Central Farmers Fertilizer Company, Chicago; C. T. Prindeville, vice president of Swift & Company, Chicago; W. E. Shelburne, president of Armour Agricultural Chemical Company, Atlanta, Ga.; Mr. Stewart; Mr. Truitt; Jacob White, president of the Nitrogen Division, Allied Chemical Corporation, New York City; and Fred J. Woods, president of The Gulf Fertilizer Company, Tampa, Fla.

At the business meeting on June 13, members of

Hugo Riemer: "Heavy toll of leaders the past year."

Vincent Sauchelli led chemical control panel.



Everett told industry: "sell a mental concept."

Murray Renick: "Dealers need more industry help."

Old White was a picture of beauty as usual. It's always a favorite spot for NPFI convention fun-seekers.

Chemical Control Project panel saw a small audience for an outstanding program. Such papers as "In-Plant Shrinkage" and others brought forth much comment and discussion from floor.

Jim Thomas, FFA leader, gave a clear picture of young farmer thinking.

Common problems found some answers as Todd Tremblay and Dick Bahme of NPFI got together.

Pitching horseshoes

Shuffleboard—always a big favorite.

At the Monsanto breakfast these ladies enjoyed the event which has become an annual affair. **Left:** Mrs. S. L. Nevins, Mrs. R. F. Hopkins, Mrs. F. H. Lavery, Mrs. S. D. Daniels. **Top right:** Mrs. G. Van Deren, Mrs. R. Coleman, Mrs. J. R. Clements, Mrs. John Perryman. **Lower left:** Mrs. E. Pate, Mrs. Russell Coleman, Mrs. T. Wright and Mrs. P. Truitt. **Center, below:** Mrs. P. Truitt, Mrs. J. T. Murphy, Mrs. P. Osborn, Mrs. J. Sargent, Mrs. L. G. Black. **Lower right:** Mrs. W. B. Copeland and Mrs. Fred J. Woods.

NPFI looks at its SELLING EFFORT

(*Continued from page 22*)

the Institute elected 12 new members to their board of directors for terms expiring in June 1963, as follows: Robert E. Ashcraft, Ashcraft-Wilkinson Company, Atlanta; Arthur Wilkinson, The Consolidated Mining & Smelting Company of Canada Limited, Montreal, Canada; L. Dudley George, Richmond Guano Company, Richmond, Va.; Elwood I. Lentz, Western Phosphates, Inc., Salt Lake City; Ben D. McCollum, J. R. Simplot Company, Pocatello, Idaho; Frank Nelson, The Rath Packing Company, Waterloo, Iowa; Hugo Riemer, United States Borax & Chemical Corporation, Los Angeles; Ed N. Shelton, Tennessee Corporation, New York City; Wayne H. Shidaker, The Farm Bureau Cooperative Association, Inc., Columbus, Ohio; C. D. Siverd, American Cyanamid Company, New York City; Tom K. Smith, Jr., Monsanto Chemical Company, St. Louis, Mo.; Fred J. Woods, The Gulf Fertilizer Company, Tampa, Fla.

Gene Van Deren, Bluegrass Plant Foods, Inc., Cynthiana, Ky., was elected to the board to fill a term expiring in June 1961; William E. McGuirk, Jr., Davison Chemical Division, W. R. Grace & Co., Baltimore, Md., and Howard A. Parker, Parker Fertilizer Company, Inc., Sylacauga, Ala., were elected for terms expiring in June 1962.

Besides his emphasis on marketing and distribution, Richard E. Bennett stated that an area of major importance involves the long range status of business in relation to the political economy in which we live . . . we must be ever vigilant in protecting private, competitive enterprise against all forces that are inconsistent with the principles and protection offered under our competitive system.

Dr. Clifford M. Hardin, chancellor of the University of Nebraska and president of the American Association of Land-Grant Colleges and State Universities, paid tribute to state agricultural extension services for "a great job of carrying progress to our American farm and ranches.

Tribute was paid to the fertilizer industry by Jim Thomas, president of the FFA. He said "We know that in spite of the increased demand for farm products, that a future in farming will demand a greater concept of the economics and management of the farm. *Buying* and *selling* will be just as important as production."

Arthur H. Motley, president, Chamber of Commerce of the United States, presented a stirring challenge to the fertilizer industry to accept its share of responsibility in civic affairs. He pointed out that the Chamber has instigated a successful training course to encourage participation in local and national politics.

REDUCING LOSS FROM OVERAGES

Our industry is losing every year an estimated 6 to 8 million dollars as overages in formulations. Can something be done to reduce this loss? Dr. Vincent Sauchelli, chemical technologist of the NPFI, moderated a panel that reported on the progress of the NPFI Chemical Control Research Project and "In-Plant Shrinkage Study." The panel featured such speakers as: Edwin M. Glocker, W. R. Grace & Company, and Stacy B. Randle, president, Association of American Fertilizer Control Officials; C. H. Russell, Monsanto Chemical Company, and J. R. Archer, International Minerals & Chemical Corporation; Dale C. Kieffer, Smith-Douglass Company, Inc., and Albert Spillman, Fertilizer Manufacturing Cooperative, Inc.

It is encouraging to note that some definite progress has been made in improving methods of sampling and chemical analytical procedures as one means of reducing the annual losses represented by overruns.

Presentation of the "Soil Management Awards for Editors" was made during the general session by Richard E. Bennett. Award winners were Carroll P. Streeter, Editor of *Farm Journal*, and William H. Kircher, Editor-in-Chief of *The Farmer*. ▲

Above: Ark-Mo's Rex Morgan, IMC's Bud Horne got together. **Below:** Roy Norris, Phil Neal of Ketona Chemical joined L. D. George, Richmond Guano Co.

Zinnie Beers, NPFI, and Davison's Wm. E. McGuirk seemed agreed: it's a great meeting!

Commercial Solvents' M. S. Leonhardt, L. A. Everett met with M. Igo, Plainsmen Fert.

thirteen ways you can improve

FERTILIZER MERCHANDISING

Excerpts of remarks by Murray Renick, Rolla Feed Mills' at the National Plant Food Institute Convention in June

YOU AS FERTILIZER manufacturers and salesmen have a great opportunity to help your fertilizer dealer stay in business in the years ahead. The fertilizer industry, as a whole, has been very neglectful in helping dealers.

You've been so anxious to make sales at all costs, you have sold to "fly-by-night" dealers and truckers. In so doing, you have all but destroyed the dealer who can give service to his fertilizer customers. The condition is so serious at this very moment that there is no incentive for the dealer to handle your products.

Dealers in most areas can only gross one to three dollars per ton. And in some areas there is no margin whatsoever—only a trucking fee which can show no profit.

Of all the products we as dealers sell to our farmer, I am confident that the dollars invested in fertilizer give him the best return. Yet the dealer is unable to make the proper return on the sale.

Discounts to truckers are greater than what three dealers together would make!

As the fly-by-nights and truckers disappear, would it not be well to select a good and dependable feed, fertilizer and farm supply dealer to handle your product?

If you had accepted this challenge in the past, you as fertilizer manufacturers and salesmen would have built one of the strongest dealer organizations in the nation—dealers that would have been loyal to your products and dealers who would be financially strong, dedicated to sales and service.

Most salesmen are of little help to us dealers as they are not properly trained. I believe that the fertilizer industry should have trained personnel, on a national or local level, so that they may hold training meetings with dealers—monthly or semi-annually—to guide them in merchandising, selling, incentive plans, credit control, and profit margins.

The salesman who has given this help to a dealer has a renewed sense of confidence and a greater thrill from his job. This type of help will contribute greatly to the dealer's loyalty to your products. It will help your salesmen to sell not just an item or two, but your full line of products.

This would not only benefit the company and salesman, but will enable the dealer to have less inventory, greater inventory turn-over with greater profit return.

What will be the qualifications of a farm supply dealer in the years ahead? First of all, this dealership must be larger than the farmer he is serving. Today it is big business, big government, big farmers, and big finance.

This dealership must have everything for the buyer's needs—such as complete fertilizer service, grinding and mixing, grain bank, bulk feeds, and modern facilities in every detail.

Management will determine the success or failure of this business in the years ahead. Management is the science, or art, of combining ideas, people, facilities, processes and materials to produce or market a product and service.

Management must have the ability to plan, organize, direct, coordinate and build for the future. The art of management is very old, but to most in the farm supply business it is becoming newer day by day.

I would like to describe to you some of the tools that we are using in our small business to get sales and measure profits—and many of the tools that your trained salesmen can bring to a dealer to help him in every day problems.

1) *Survey your market* to find out your customer's needs. Find out his livestock population, size of his barn, etc.

2) *Departmentalize* your farm supply store to find out which items are losing money—or making money. Get rid of non-profitable items.

3) *Make up profit and loss statement monthly.* Compare this year with last year—or several years back, so you may compare expenses and see those that are out of line.

4) *Route sheets for outside retail salesmen*, measuring against previous sales.

5) *Route sheets for wholesale salesmen*, enabling management to measure costs of all items sold.

6) *Truck records* to measure cost of goods hauled. Compare with previous years.

7) *Incentive plans* for outside salesmen, grinding department, as well as all employees.

8) *Aging accounts.*

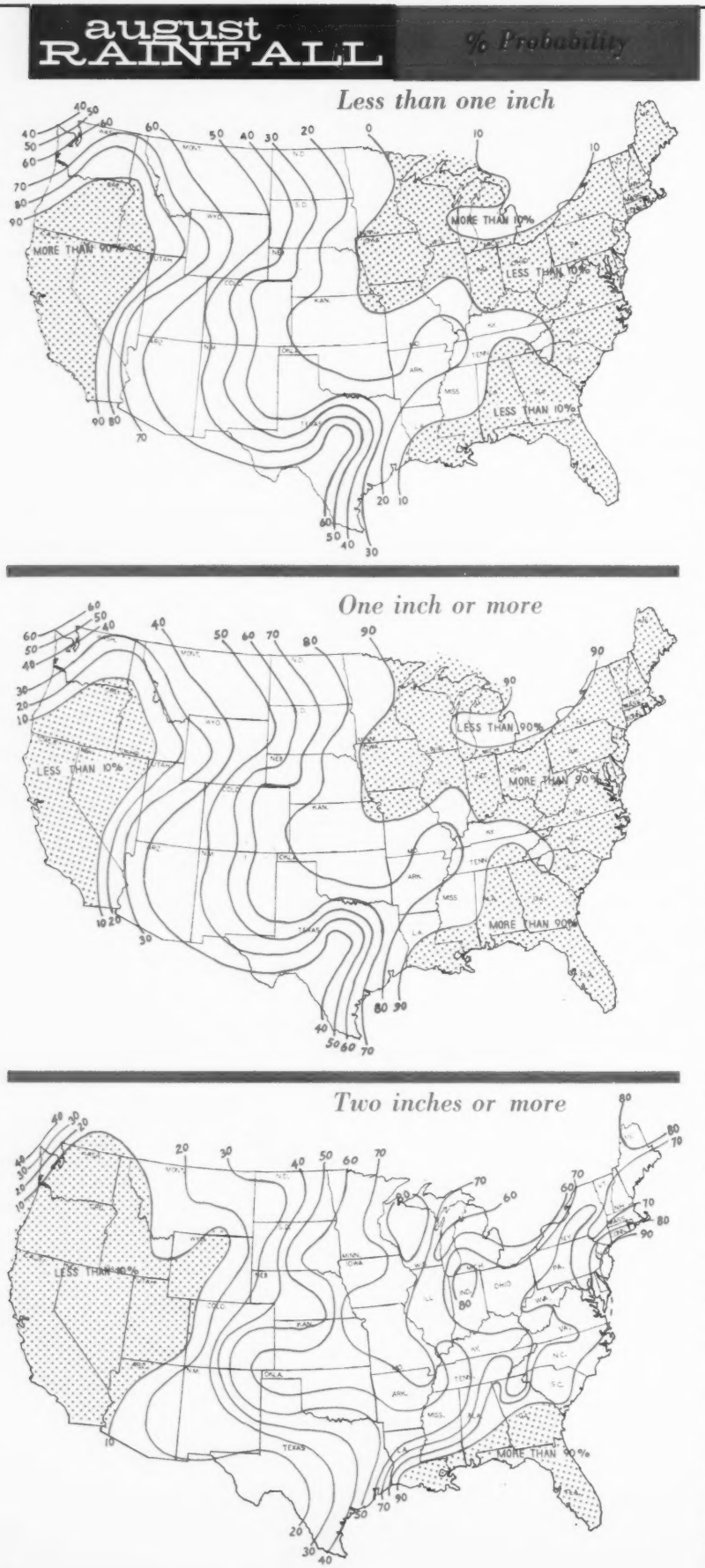
9) *Credit control.*

10) *Testimonial ads* in newspapers.

11) *Cooperative advertising.*

12) *Regular training meeting* with employees to get their ideas and criticisms.

13) *Measure profits* in every detail and what they meant to me.



FC continues its exclusive weather service for the industry

By VAUGHN HAVENS

THE CHANCES of receiving various monthly rainfall totals in August are shown by the accompanying maps. The lines on the maps show the % probability which can readily be converted to express the risk of a certain event occurring. For example, 70% probability indicates 70 chances out of 100 that the event will occur, or odds of 7 out of 10 in favor of the occurrence.

It should be remembered that this information is not a "weather forecast" in the usual sense. Forecasts of the weather for a month or more are frequently attempted, but at present their accuracy is quite limited. In addition, when long range plans are based on such forecasts, the user has no way of knowing how much confidence may be placed in them and thus no way of evaluating the risk of a planning error due to an erroneous forecast.

Thirty years of August rainfall records for more than 200 U. S. Weather Bureau stations in every part of the country have gone into the preparation of these maps. The period of years used was 1928 through 1957 for all but a few of the stations. The maps illustrate the use of past weather records in order to estimate future weather risks. These probabilities are the only reliable way in which weather information can be applied to planing more than a few days ahead.

HOW TO USE THE MAPS

Here are some examples of the way in which the maps can be used. If your plans depend on abundant August rainfall, say four inches or more, and you are located in central Kentucky, the four inch map shows a probability of 20 to 30%.

This means that there is about 1 chance in 4 of receiving that much rainfall in this region during the month.

If you are located in southern Georgia, and have the same rainfall need, the odds in your favor are much better—about 80% or 8 chances out of 10.

On the other hand, if you live in Iowa and are concerned about a very dry August, the less-than-one-inch map shows that the probability of this small amount occurring is under 10%. If you live in central Wisconsin and your plans will be adversely affected unless August brings at least two inches of rain, the corresponding map indicates a probability of 80% or slightly higher that this amount will occur.

If your area of interest is completely surrounded by one of the probability lines, the following rules apply. If the next line has a higher value, all points within the encircled area have a rainfall probability slightly less than the value shown for the encircling line. If the next line has a lower value, the probability for the area in question is somewhat higher than the value for the encircling line. For instance, on the 5-inch map the probability for the area in northwestern Missouri and eastern Kansas is slightly higher than the 30% given for the line bounding the area, since the next line is labelled 20%.

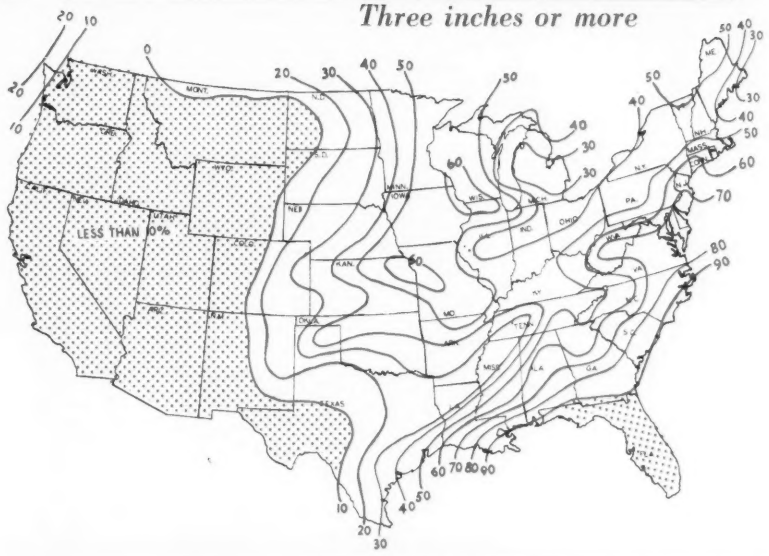
HOW THEY WERE PREPARED

Over 6000 items of information, the product of thirty years of August rainfall records for about 200 Weather Bureau stations, were compiled and analyzed in order to draw these maps. In mountainous country the maps should be interpreted cautiously, since differences in elevation and exposure to the wind can cause large differences in rainfall between nearby locations and thus greatly change the probabilities. In addition, it must be remembered that most summertime rainfall comes from local showers and thunderstorms. August rainfall distribution is consequently "spotty" and the maps should be used with the idea of obtaining a general estimate of the rainfall odds in various parts of the country rather than an exact figure. ▲

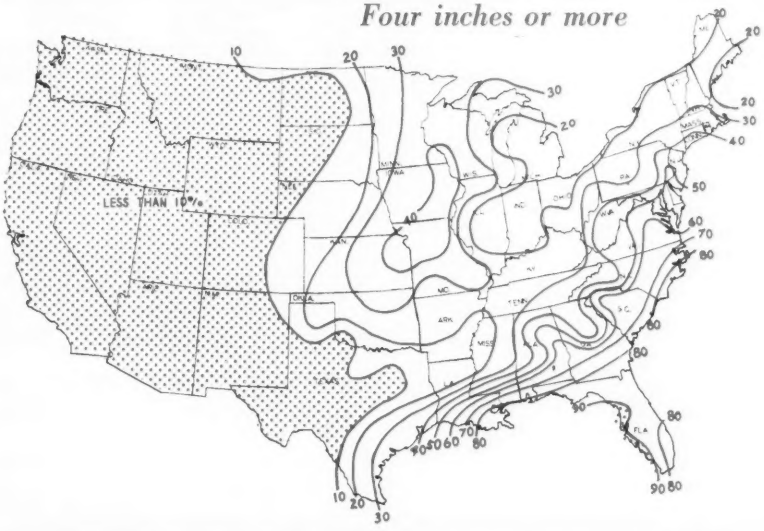
% Probability

august RAINFALL

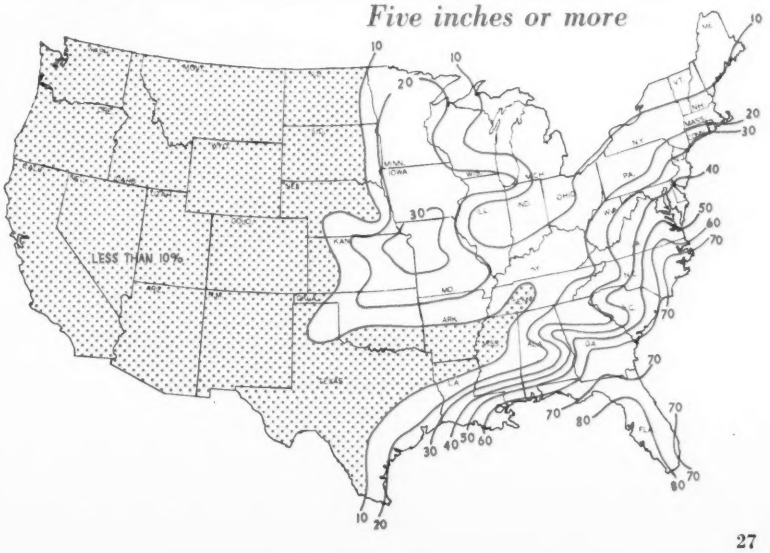
Three inches or more



Four inches or more



Five inches or more



FUME CONTROL in S M

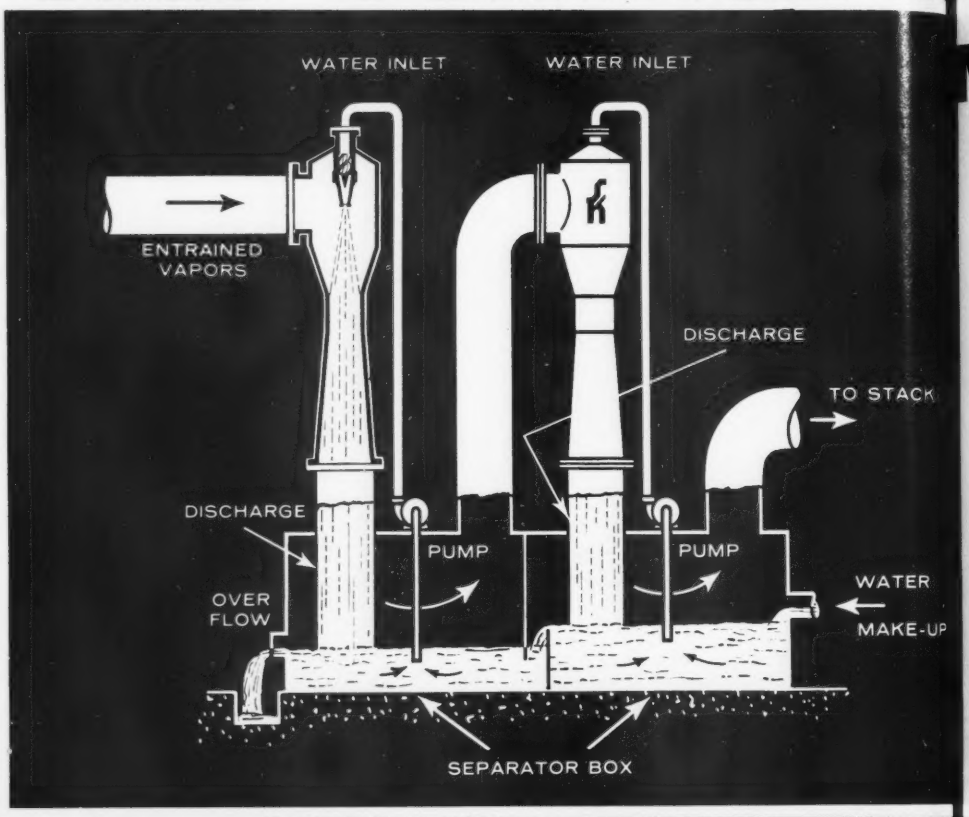
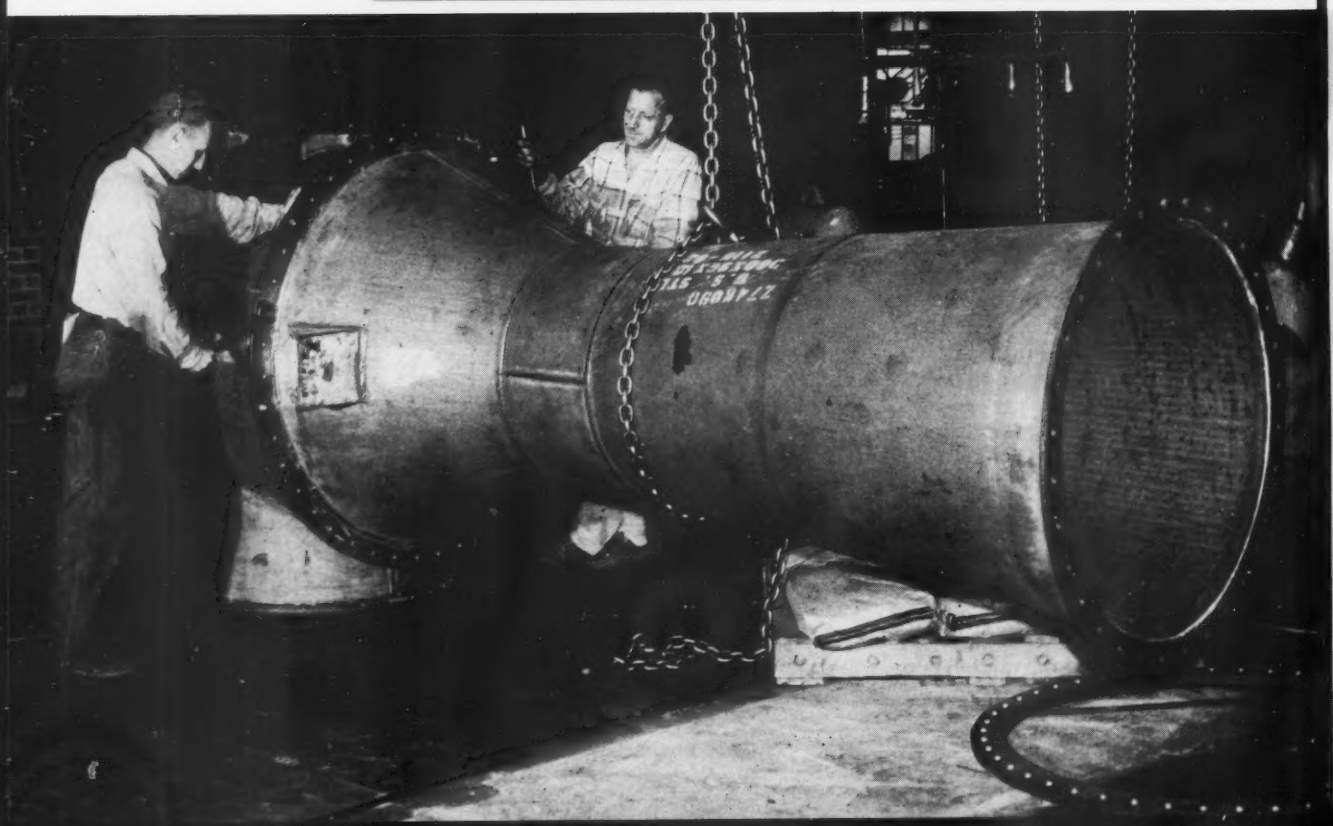


Figure 1. A typical two-stage Ejector-Venturi Fume Scrubber arrangement.

Figure 2. A large scrubber in final assembly stage at the Schutte and Koerting Co. plant.



Superphosphate Manufacture

Ejector-Venturi scrubbers are in service in over 75 plants. Considering severity of the application, good service life is now generally reported.

By ROBERT L. WEBB
Engineer-in-Charge, Fume Abatement
Schutte & Koerting Company

NATURAL occurrence of fluorides in phosphate rock has plagued the phosphate chemicals industry since its inception. These fluorides make their presence known as "gaseous silicon tetrafluoride" upon acidulation of the ground rock in superphosphate fertilizer production. A decade or so ago such fumes were simply allowed to escape into the atmosphere. While such vapors are not normally present in sufficient concentration at ground level to endanger human life, they have proved to be particularly harmful to grazing animals. This is due to the unusual ability of vegetation to concentrate fluorides over a period of time.

Realizing these consequences, manufacturers of both large and small quantities have faced up to their civic duties and have eliminated these dangerous pollutants, thus earning the goodwill of their neighbors as well as profits. The profits, of course, come from the sale of recovered silicofluorides.

Generally 30 to 35 per cent of the fluoride available in the original rock is emitted as silicon tetrafluoride. However, since the fluoride content, handling methods, and other factors vary considerably, actual concentrations may run from about 100 mg. per cubic foot to almost 3000 mg. per cubic foot, in terms of total fluorine. A good average is about 1000 mg. per cubic foot. Generally, about 6 to 10 mg. of rock particulates per cubic foot are also present. Fume temperatures are commonly in the range of 140 to 160° F., and occasionally go to 200° F.

Since silicon tetrafluoride reacts readily with water, wet scrubbing was the obvious approach to proper fume control. However, first attempts to use simple multi-nozzle spray chambers were dismal failures. The reaction with water yielded an insoluble tenacious silica precipitate as well as corrosive hydrofluosilicic acid. Nozzle and fan plugging were frequent occurrences and available materials rapidly corroded. This led the industry to become interested in the Ejector-Venturi Type Fume Scrubber already widely used in the chemical industry. The Ejector-Venturi type of design offered many distinct advantages. It had a clean, straight-through design. There were no moving parts to get out of adjustment, corrode and wear. It developed its own draft, thereby eliminating a troublesome fan.

Originally, the chief difficulty encountered in applying the Ejector-Venturi Scrubber for this service was the spray nozzle. The first nozzles tested were neoprene-coated metal or impregnated canvas duct. These proved to have limited service life due to the highly abrasive type of scrubbing liquid. The present nozzle was developed by Schutte and Koerting Company, the originators of the Ejector-Venturi Scrubber, in cooperation with one of the country's leading rubber goods manufacturers. This nozzle is particularly rugged. In construction it is not unlike a premium truck tire. A solid heavy wall of neoprene is used and double reinforced with nylon fabric and monel wire. This design proved to be outstandingly durable in this unusually severe application.

The success of several early installations led to the virtual adoption of the Ejector-Venturi Scrubber as an industry standard. Today over 75 installations are in service handling a total capacity well above 1,000,000 cfm.

Field tests of efficiency on total fluorides have indicated that 92 per cent removal can be reached easily with a single-stage installation. The use of two stages, in series, can reach 97 to 98 per cent—all without the use of a fan or high pressure drop device.

Early installations made no attempt at recovery of waste silicofluorides. These were frequently dumped into nearby streams with a lethal effect on stream inhabitants, and for a short while it appeared that an air pollution problem had been exchanged for a stream pollution problem. Fortunately, however, due to increased uses including municipal water supplies the market for fluoride materials developed to the point where it became profitable to save the effluent. Thus, recovery became an economy.

Figure 1 shows a typical two-stage installation of a Schutte and Koerting Fig. 4010 type Ejector-Venturi Scrubber. Normal liquid to gas ratio is 1 gpm per 30 cfm at flowing conditions. Minimum suggested operating motive or spray liquid head is 90 to 95 ft. (40 psig water pressure). With both units contributing

¼" water draft, adequate differential should be available for all ordinary installations.

In the range of gas volumes usually encountered, 6000 to 10,000 cfm, first cost per stage is currently about 50 cents per 1000 cfm, in neoprene or similar rubber-lined construction with the specially fabricated neoprene nozzle. Power requirements generally run from 1.2 to 2 h.p. per 1000 cfm per stage for pumping since no fan is required. Figure 2 shows a typical unit at the completion of fabrication.

Continued expansion of the silicofluoride market and simple process economics has encouraged manufacturers to increase the concentration of their scrubbing liquor well beyond the 5 or 10 per cent total solids concentration limit recommended for best single-stage performance and minimum maintenance to essentially equilibrium concentrations. Basic physical chemistry, of course, informs us that when circulating an equilibrium solution in a scrubber the net efficiency must be zero. This is the principal reason for recommending two-stage operation where high concentration recovery is a major factor. By a simple batch-type operation the downstream scrubber can be allowed to reach its maximum concentration while the upstream unit serves as clean-up scrubber. The clean-up liquor can then be used as feed for the downstream unit on the next batch. Alternately this can be done by continuous overflow as in Figure 1.

WHAT IS THE PERMISSIBLE CONCENTRATION?

There is always the question of what discharge concentration of fluorides is realistically permissible due to the cumulative effect on plant life. Some industry sources feel that a 15 mg. per cubic foot fluoride stack concentration would be entirely acceptable. One state has proposed a limit along the order of 0.1 mg. per cubic foot, but this is presumably the concentration in ground level air. Considering stack dispersion, this value may not be too unreasonable, but it would be exceedingly difficult to obtain (and measure) in the stack. Stack concentrations as low as 3.4 mg. per cubic foot have been obtained with ejector scrubbers in stages.

The maximum concentration obtainable in first stage scrubbers depends largely on the inlet gas concentration and temperature. Concentrations in the range of 20 to 25 per cent hydrofluosilicic acid have been reported for inlet gas concentrations of about 1000 mg. fluoride per cubic foot.

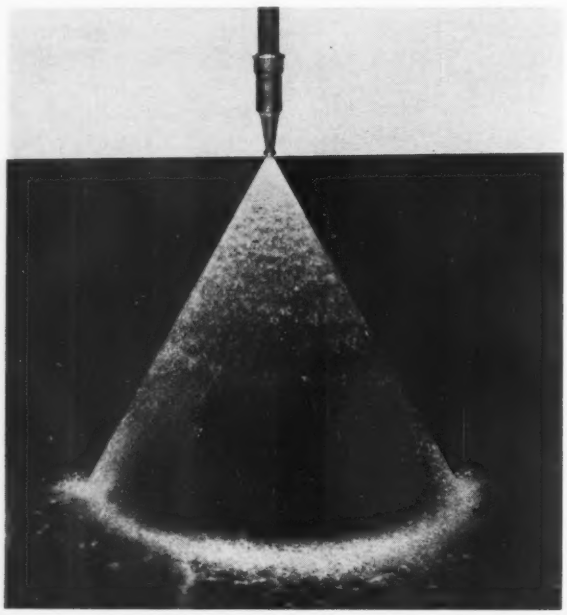


Figure 3. Normal spray pattern of a type nozzle used in Ejector-Venturi Scrubbers.

OBSERVE PRECAUTIONS FOR BEST RESULTS

Good service life, considering the severity of the application, is now generally reported. Certain precautions, however, must be observed for best results. A common error is to stop nozzle flow while fairly concentrated fumes are still entering the scrubber. This results in the formation of silica deposits on the still-wet nozzle internals which leads to a distorted spray pattern and ultimately nozzle plugging. Figure 3 shows a typical spray pattern of a properly functioning nozzle. The best procedure is to close off gas flow before scrubber shutdown.

Another common error that can result in limited service life is the use of spent sulfuric acid such as alkylation acid from refineries or other sources. This acid frequently contains aromatic or other hydrocarbons injurious to rubber lined equipment. Such organic materials are vaporized at least partially by existing temperatures and condense in the scrubber bodies. This usually softens the lining material and loosens the rubber-to-metal bond. If spent acid must be used its composition and source should be thoroughly checked to avoid costly equipment failure. For best lining life, fume temperatures should also be kept under 180° F.

MAINTENANCE MAY BE AT FAULT

Limited scrubbing performance is usually the result of over-concentration with single-stage units, or poor maintenance. Occasionally, multi-stage units are operated without isolation of liquid concentrations. This permits the liquid in all scrubbers to approach equilibrium with the inlet gas, causing the same decline in efficiency.

Another major problem is insufficient motive liquid or pressure. An indication of nozzle plugging is increasing motive pressure with declining flow which results from increased pressure drop across the nozzle. This may be difficult to observe, however, if plugging of the entire liquid line is coincident. The simplest procedure is to familiarize operators with visual characteristics of the spray when the unit is first installed. Then changes can be easily noted. Also, it should be observed that nozzle flow rate is a function of the liquid head or the "pressure to liquid density ratio." Due consideration must be given to the fact that liquid density increases with concentration.

From an "operation's" standpoint, a little good housekeeping and common sense will go a long way toward high production, a clean stack, and good community relations throughout the peak output seasons. ▲

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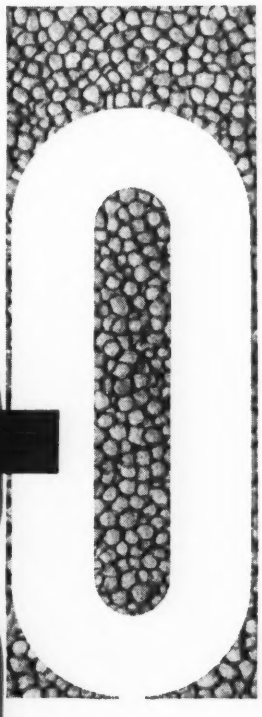

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Ratio Analysis	Pounds of Material Required			
	16-48-0	Ammo. Sul. (21%N)	Triple (46%APA)	Potash (60% K_2O)
1-1-1 14.4-14.4-14.4	602	917		481
1-2-2 11-22-22	917	349		734
1-4-2 8.5-34-17	1063		370	567
1-4-4 6.6-26.5-26.5	828		290	882

**Other higher analysis nitrogen materials (urea and ammonium nitrate) may be substituted in above formulations.*
Analysis in the more popular ratios, such as 12-12-12, 10-20-20, 6-24-12, 5-20-20, can be manufactured by the addition of granular dolomitic limestone or other materials.

LIQUID FERTILIZER CORROSION PROBLEMS

By W. W. ARNOLD*
Nitrogen Division
Allied Chemical Corp.

New products and new materials of construction are being developed which will undoubtedly solve many of the current corrosion problems.

CORROSION of a metal may be defined as the destruction of the metal by chemical or electrochemical action. Typical chemical destruction may be illustrated by the action of ortho-phosphoric acid on a steel tank. Essentially, the steel tank is "eaten" by the acid through an exchange of ions between the steel and the acid.

Salts in solution can also be a destructive force, and this is of particular consequence when the liquid contains high salt concentrations such as found in liquid fertilizers. In general practice phosphoric acid is neutralized with ammonia forming mono- and di-ammonium phosphates. To this solution is often added more nitrogen in the form of ammonium nitrate and urea, and potassium usually in the form of potassium chloride. It is pretty obvious then that anyone handling this type of chemical solution has on his hands a rather formidable collection of corrosive salts even though the fertilizer solution may be in a neutral state.

ELECTROCHEMICAL CORROSION

Electrochemical (or galvanic) corrosion is another very important factor to be taken into consideration in storing, manufacture and use of liquid fertilizers. Electrochemical corrosion occurs when two dissimilar metals are in contact with each other in the same liquid. The result is that one of the two metals, the more active, is corroded; the less active is not corroded but rather is actually protected from corrosion because of the electrochemical action. It is for this reason that brass or bronze, active metals, should not be used in conjunction with aluminum or steel and why stainless steel, a very inactive metal, will not be corroded easily by electrochemical action.

Similar corrosion can also take place in the presence of only one metal if the concentration of the corroding solution varies at separate points on the surface of the exposed metal. This is called concentration cell type corrosion.

There are other types of corrosion such as erosion corrosion and cavitation which can take place under specific conditions; however, those already cited are considered the major types of corrosion which have been experienced in liquid fertilizers.

DON'T OVERLOOK TEMPERATURE

In addition, one should not overlook the importance of temperature as a factor in corrosion acceleration. The chemical action of an acid or a neutral salt on a metal or the electrochemical corrosion set up between two dissimilar metals is increased as the temperature goes up and the corrosion thus occurs more rapidly.

One of the most difficult materials to store from a corrosion standpoint is phosphoric acid. The chromium-nickel stainless steels, and in particular type 316, are excellent for use with phosphoric acid but are

Presented at the Southern Regional Liquid Fertilizer Conference, Eatonton, Ga., February 9–11.

limited in use because of their high initial cost. Rubber lined steel tanks and flexible plastic liners in steel tanks are much more economical. A new development for the storage of 75% phosphoric acid is an asphalt and burlap lined pool. This appears to be very economical especially for quantity storage. Pipe lines and valves for handling phosphoric acid should be stainless steel, rubber lined or of a suitable plastic such as polyvinyl chloride. It should be remembered, however, that rubber linings and polyvinyl chloride are affected by temperature and should not be used on lines where excessively high temperatures will be experienced.

PROS & CONS ABOUT TANK MATERIALS

Aluminum is the best storage material for tanks to handle nitrogen solutions other than aqua ammonia or anhydrous ammonia. Aqueous solutions of ammonia, commonly used as a source of nitrogen, and a neutralizing agent for phosphoric acid, can be stored in appropriately constructed mild steel tanks.

Various laboratory corrosion tests have been conducted on carbon steel, aluminum alloys and stainless steels to evaluate their suitability as constructional materials for storage, transportation and application of complete liquid fertilizers.[1, 2] Other tests are still being conducted to determine the suitability of other materials such as the fiberglas reinforced polyesters.

In the main, laboratory data has been substantiated in field tests and under actual working conditions. Stainless steel, particularly the 304 and 316 alloys, have worked exceptionally well for transport and applicator tanks. From a cost standpoint stainless steel is not economical for large storage tanks.

Aluminum, the most frequently used metal for the fabrication of transport and applicator tanks handling nitrogen solutions, has been found in field tests to be inadequate for use with complete liquid fertilizers. Corrosion takes place usually in the form of severe pitting rather than general surface attack. This corrosion on aluminum is accentuated at temperatures above ambient temperature.

USE OF MILD STEEL

Either because of cost or corrosion the liquid fertilizer industry has, in general, turned to mild steel for storing and handling liquid mixtures. The biggest problem encountered with the use of mild steel is apparently an oxidation type of corrosion which takes the form of rust scale. This corrosion is more aggressive in the vapor space above the liquid level and is most pronounced at the liquid-vapor interface. This scale continually sloughs off and has created a considerable problem during field application by stopping up line screens, valves and metering orifices.

A new type of tank material is coming into use which may eliminate many of the corrosion problems now being experienced with steel. Various polyester resins are being tested and used for tank fabrication. These plastics are generally being reinforced with fiberglas for added strength.

One problem has been to find a resin which will satisfactorily resist attack from all of the liquid fertilizer materials and yet withstand the stresses encountered during transportation and field application of the contained liquids. There is such a wide variety of materials to be applied through these tanks that formulating such a resin is extremely difficult.

Complete liquid fertilizers are usually made by neutralizing phosphoric acid with ammonia in a mixing tank or reactor tube. The material of construction for this mixing equipment is for the most part stainless steel. There are specific cases where mixing techniques allow the use of mild steel construction; however, stainless steel is still recommended unless very close controls on acidity and temperature are maintained. During the manufacturing process the acidity of the solution may drop as low as pH 3 and temperatures ranging in the neighborhood of 240° F. have been experienced.

pH CONTROL AND CORROSION

pH control of the finished product is also an important corrosion factor in the manufacture of fertilizer solutions. In general practice, these liquids are produced by reacting enough ammonia with the phosphoric acid to give an ammonia to phosphoric acid mole ratio of about 1.69. This corresponds to a nitrogen to phosphorus pentoxide weight ratio of 1 to 3. However, the 1.69 ratio is not the best for solubility, which is highest for many grades at a ratio of about 1.55 to 1.60. Reducing the ammonia to acid ratio lowers the pH and if the pH is lowered far enough corrosion is increased. Therefore, a balance must be made between solubility and pH so that satisfactory solubility can be achieved, if possible, without lowering the pH to a point where corrosion is accelerated. From a corrosion standpoint a pH of 6.0 or higher is believed to be most desirable.

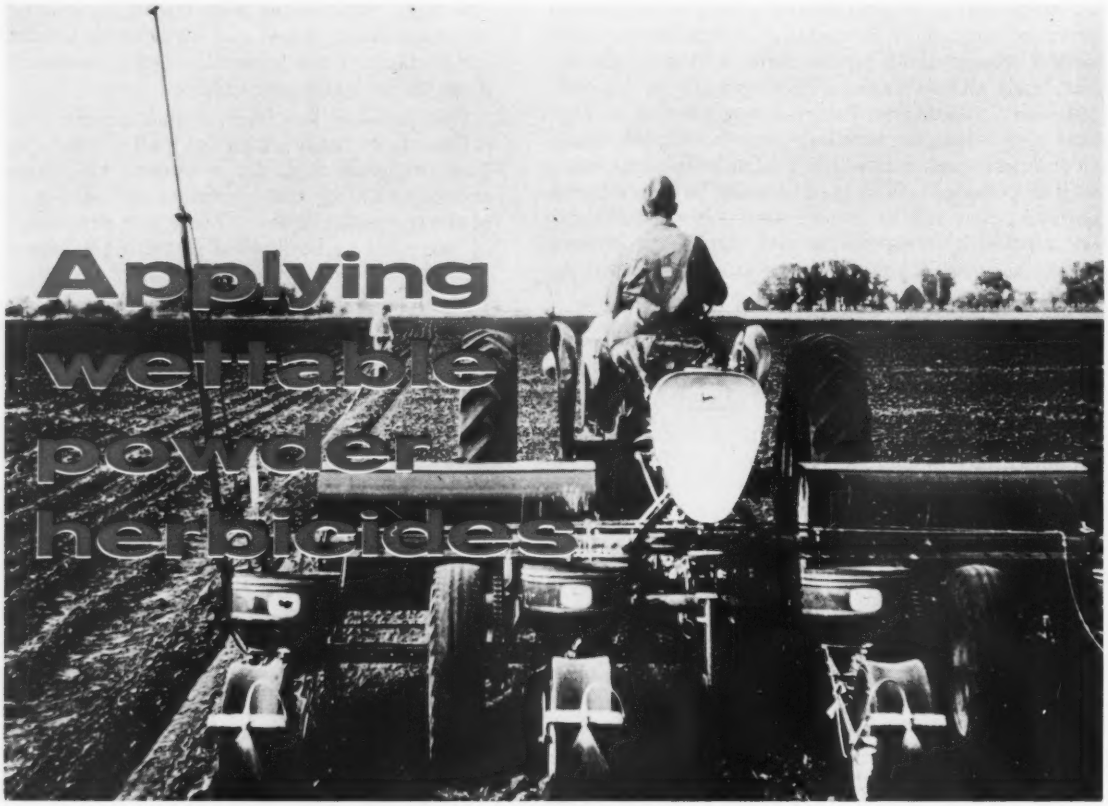
There are new products and new materials of construction being developed which will undoubtedly solve many corrosion problems now being experienced. However, we cannot assume that new construction materials will always work and it is wise to be just a bit skeptical about these products until they have proven successful.

For the most part materials of construction for handling fertilizer solutions have been decided upon by the trial and error method. It must be remembered that laboratory corrosion tests are only indicative of what may take place in actual practice; therefore, the liquid fertilizer industry must, to a great extent, depend upon reliable field experience and information supplied by raw material suppliers and equipment manufacturers who have the experience and background necessary to avoid many of the corrosion problems which are normally encountered. ▲

[1]Vreeland, D. C., Kalin, S. H., Corrosion 12, No. 11, 569t-75t (1956).

[2]Hatfield, J. D., Slack, A. V., Ag. and Food Chem. 6, No. 7, 524–531 (1958).

MATERIALS HANDLING
CUSTOM APPLICATION



THE MODERN wettable powder herbicides that make corn production so much easier by reducing or eliminating cultivation are themselves easy to apply. Increasingly popular pre-emergence herbicides like Simazine and Atrazine mix readily with water and are conveniently applied from most herbicide sprayers, including those previously used for water-soluble and emulsifiable chemicals. Simazine 80W and Atrazine 80W herbicides are finely ground wettable powders containing 80 per cent active ingredient.

USE A GOOD P.T.O. PUMP

Any good power takeoff pump that delivers 10 to 12 gallons per minute works well with these modern weed killers. It must provide a good return flow into the bottom of the tank to keep the herbicide continuously mixed with water. For application of the wettable powders, the sprayer should be equipped with 50-mesh or larger screens in the strainers at the tank intake, in the lines and in the nozzles. Be sure to clean the sprayer thoroughly before use, and replace any nozzles which do not discharge accurately.

For over-all weed control, broadcasting the herbicides with boom sprayers within a few days after planting the corn is convenient. For control of weeds just in the row, band-spraying at planting is the thing. In this, the herbicide mixture is applied in 12- to 14-inch bands over the row from nozzles attached to the corn planter. Band-spraying saves on labor and equipment, and it requires only a third as much herbicide.

Many sizes and types of nozzles are successfully used to apply wettable powder herbicides. TeeJet 8003, 8004 and 8005 nozzles are suggested for broadcasting 20 to 40 gallons of Simazine or Atrazine herbicide mixture per acre at recommended speeds and pressures. The 8003E, 8004E and 8005E tips are suggested for band-spraying the recommended seven to fourteen gallons per acre. County agents and sprayer dealers can supply complete information on the right nozzles for application of wettable powder herbicides under all conditions.

SPRAYER CALIBRATION

Calibration for the herbicide sprayer is as simple as it is for the corn planter or the grain drill. One easy way to determine the gallonage applied per acre is to fill the tank, spray a measured acre at recommended speed and pressure, and measure the re-fill. Or spray any known part of an acre and by simple arithmetic compute the acre rate.

County agents, the state agricultural colleges, herbicide manufacturers and spraying equipment companies all provide other simple procedures. One herbicide manufacturer lists the ounces of mixture for each nozzle to discharge per minute to apply the suggested gallonage per acre. To band-spray seven gallons of Simazine or Atrazine herbicide mixture at four

miles per hour, for example, it is suggested that pressure be adjusted up or down until the 8003E nozzle delivers 23 ounces per minute.

After gallonage delivered per acre by the sprayer is set, it is simple to mix into the tank as many times the recommended per-acre rate of herbicide as acres the tank supply will cover. Or follow the herbicide manufacturer's suggestions.

EFFECTIVE ACRE RATES

Effective acre rates depend primarily on soil type; the lighter the soil, generally the lower the rate. For band spraying sandy, sandy loam, sandy clay, low-organic clay and loam soils with seven gallons of mixture per acre, for example, the recommendation is for mixing six pounds of Simazine 80W or Atrazine 80W herbicide into every 50 gallons of water in the tank. For higher organic clays and loams, including the dark prairie soils of the Corn Belt, the band-spray recommendation is for nine pounds of the wettable powder herbicides for every 50 gallons. For band-spraying mucks and other very high organic soils at seven gallons of mixture per acre, mix 12 pounds of Simazine 80W or Atrazine 80W herbicide into every 50 gallons of water. For broadcast spraying these soil types at 20 gallons per acre, add 6¼ pounds, 9½ and 12½ pounds of Simazine or Atrazine 80W herbicide to every 50 gallons of water. ▲

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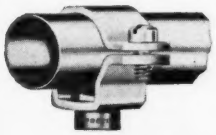

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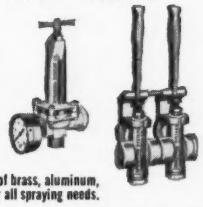

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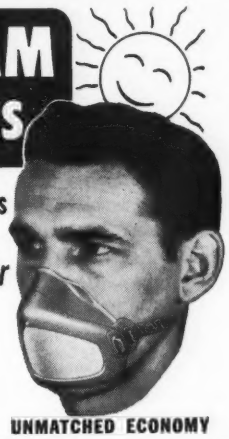

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PATENT REVIEWS

By Dr. Melvin Nord

PRODUCING FERTILIZER PELLETS

U. S. 2,926,079, issued Feb. 23, 1960 to Benjamin G. Smith, assigned to The Chemical & Industrial Corp., describes a process for the formation of fertilizer pellets, generally in the range of 0.065–0.185 inch in diameter.

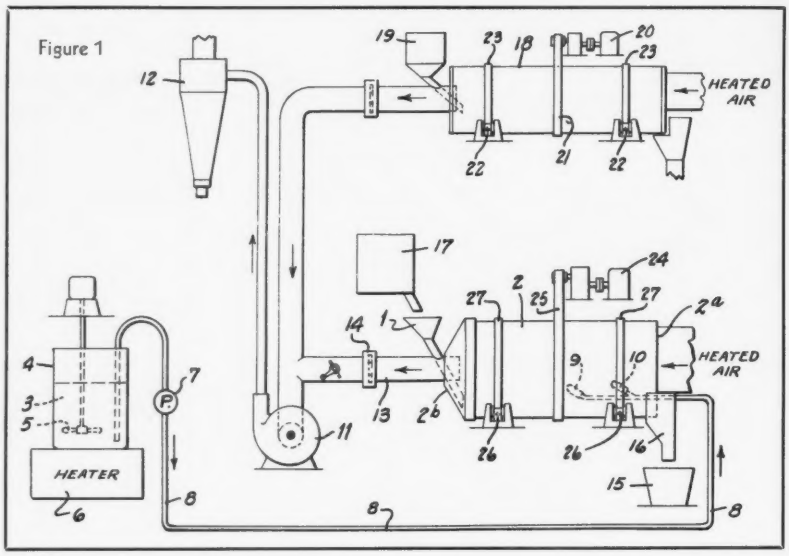
As shown in Fig. 1, solid feed consisting of recycled and other solids is passed from feeder 1 to granulator 2 to form a nuclei bed in the granulator. A slurry 3 containing fertilizer raw materials, to be coated on the nuclei, is mixed in mixing and holding tank 4 by stirrer 5, the slurry being heated to the desired temperature by heater 6.

The slurry is then pumped by means of pump 7 through line 8, where it is sprayed over the nuclei bed through nozzles 9 and 10. The moisture content of the nuclei bed is controlled by passing hot gas or a mixture of hot gases through granulator 2. The hot gas enters at inlet end 2a and exits at the opposite conical end 2b of the granulator, the wetted nuclei bed being showered through the hot drying gas. Suction is provided at the gas exit end of the granulator by means of blower 11 to aid in the withdrawal of the exit gas from the granulator. Preferably, blower 11 is connected to a cyclone separator 12 for the removal of fine particles present in the exit gases passing from the granulator to the blower 11 through line 13. A damper valve 14 is provided for controlling the flow of exit gas.

The nuclei coated material formed in the granulator is collected in the product receptacle 15 through discharge hopper 16. The sizes that are too coarse are ground, and the too small in size are transferred to recycle receptacle 17, and in turn passed to hopper or feeder 1.

Preferably, a dryer 18 is provided to condition the formed granules fed through feeder 19. The dryer may be a small-scale rotary granulator, belt driven by means of motor 20 and belt 21. The dryer is rotatably supported on rollers 22 by means of bands 23 supported on said dryer and in contact with said rollers. Hot gases similar to those blown through the granulator are coursed through the dryer.

Figure 1



Granulator 2 is of the conventional rotary design, being belt-driven by means of motor 24 and belt 25. The granulator is rotatably supported on rollers 26 by means of bands 27 supported on the granulator and in contact with the rollers.

The paramount features of the process are:

1) Bed moistures are maintained below the agglomeration point.
2) A substantial portion of the raw materials are introduced as a slurry.
3) Treatment of dry pulverulent material is minimized.
4) The "in process" material must be continuously agitated or rolled.
5) Hot gases are intimately comingled with the forming granules.

PESTICIDES

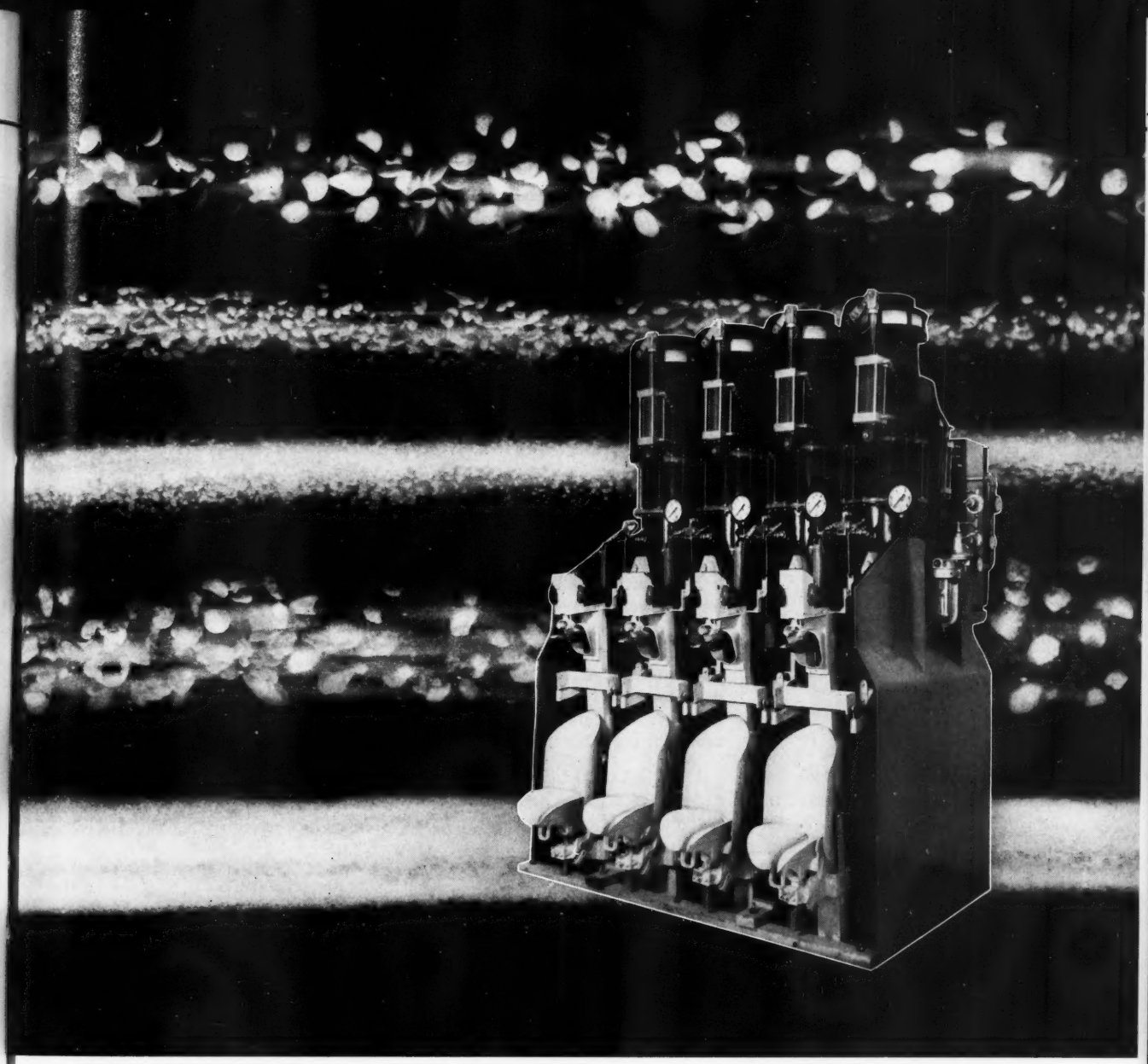
U. S. 2,924,505, issued Feb. 9, 1960 to Edward C. Page, Jr. and Roland W. Erling, assigned to Henry Bower Chemical Mfg. Co., provides a non-crystalline, blue copper hydrate-phosphorus complex in which the copper is present in a form useful for fungicidal purposes and, at the same time, is combined in a product which is stable over long periods of time. The amount of phosphorus present in the complex is sufficient to stabilize the product against the formation of cupric oxide.

To prepare the complex, an aqueous solution of trisodium phosphate is reacted with an aqueous solution of copper sulfate. The resulting slurry is treated with an aqueous solution of sodium hydroxide and an aqueous solution of copper sulfate, forming a precipitate containing phosphorus bound in the complex.

U. S. 2,924,553, issued Feb. 9, 1960 to Joseph W. Baker and George A. Saul, assigned to Monsanto Chemical Co., discloses the nematocidal properties of O, O-dimethyl 2, 4-dichlorobenzoylphosphonate. This compound is prepared by reacting 2, 4-dichlorobenzoylchloride with trimethyl phosphite.

U. S. 2,927,053, issued March 1, 1960 to Jamal S. Eden and assigned to Diamond Alkali Co., describes a method of destroying fungi, employing alkoxybenzyl alkanol amines.

U. S. 2,916,415, issued Dec. 8, 1959 to Joe R. Willard and John F. Henahan, assigned to Food Ma-



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chinery & Chemical Corp., discloses the pesticidal properties of methylene bisdithiophosphates. These compounds may be used to control insects, arachnids, nematodes, and fungi.

U. S. 2,916,855, issued Dec. 15, 1959 to Bernard J. Thiegs and assigned to The Dow Chemical Co., describes a method of fumigation of soil with volatile materials, using a blanket of foam over the soil.

PLANT GROWTH REGULANTS AND HERBICIDES

U. S. 2,924,516, issued Feb. 9, 1960 to Francois D'Ogny, assigned to Pechiney Compagnie de Produits Chimiques et Electrometallurgiques, provides an herbicide for the killing of vegetation in general, suitable for use in complete clearing of fields, the killing of undergrowth, couch grass, brambles, and the like, and for the topping of potato plants.

The herbicidal composition includes sodium chlorate and sodium fluoride. The effectiveness of the mixture in killing weeds and other vegetation is superior to the combined action of each, i.e. there is a synergistic effect.

U. S. 2,926,078, issued Feb. 23, 1960 to Melvin J. Josephs, discloses the herbicidal properties of 2, 3, 6-trichlorobenzyl alcohol.

U. S. 2,927,014, issued March 1, 1960 to Lewis E. Goyette and assigned to Virginia-Carolina Chemical Corp., relates to the use of phosphinates as herbicides for all of the plant forms, and the use of both phosphonates and phosphinates as herbicides for all of the plant forms other than seeds.

U. S. 2,916,369 and **2,916,370,** issued Dec. 8, 1959 to Harry Tilles and Joe Antognini, disclose the herbicidal properties of diallylthiolcarbamates and chlorinated thiolcarbamates. They may be used as preemergence or postemergence herbicides.

U. S. 2,918,413, issued Dec. 22, 1959 to Carl T. Redemann and assigned to The Dow Chemical Co., describes an improved method for producing gibberellins, in which senecioic acid salts are incorporated into the nutrient medium.

U. S. 2,919,182, issued Dec. 29, 1959 to Marion W. Harman and John J. D'Amico, assigned to Monsanto Chemical Co., discloses a method of controlling vegetation with a phytotoxic ester of a dithiocarbamic acid.

SWEETENING METHOD

U. S. 2,921,409, issued Jan. 19, 1960 to Eli Seifter and assigned to Monsanto Chemical Co., describes a method of improving the palatability of fruit and vegetables by treating plants with a synthetic sweetening agent such as saccharin or sodium cyclohexyl sulfamate.

These substances are taken up by the leaves, stems, or roots of plants without enzymatic breakdown in the translocation of the sweetening agent into the fruit or vegetables.

FERTILIZER PROCESSES

U. S. 2,925,326, issued Feb. 16, 1960 to Hans Pieper, Hans Ebert, and Gunther Breil, assigned to Knapsack-Griesham A. G., describes a method of converting to phosphorus pentoxide the phosphorus contained in the stiff aqueous phosphorus sludge layer obtained in the thermal reduction of phosphorus-containing ore.

U. S. 2,926,070, issued Feb. 23, 1960 to Thomas H. Milliken, Jr. and assigned to Houdry Process Corp., describes a process for the recovery of both ammonia and the oxides of sulfur from ammonium sulfate produced by the neutralization of sulfuric acid wastes with ammonia.

The ammonium sulfate is introduced into contact with a bed of high surface area particles of zinc oxide at 500–1000° F. The zinc oxide reacts with the ammonium sulfate, to liberate ammonia and form zinc sulfate. The sulfate is subsequently decomposed at 1100–1800° F.

U. S. 2,927,010, issued March 1, 1960 to Ira M. LeBaron and assigned to International Minerals & Chemical Corp., describes a process for the beneficiation of sylvite ores, using an electrostatic separation step and a fractional crystallization step. ▲

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PEST REPORTS

*By Kelvin Dorward**

THE COTTON boll weevil was becoming active in several states by the latter part of May. In the lower Rio Grande valley of Texas weevil activity was on the increase with reports of punctured squares being 25 per 100. Adults were active and feeding as far north as Waco, Texas. Counts of adults in the Waco area during the week ending May 20 averaged 58 per acre compared with 74 during the corresponding week in 1959. In the Tallulah, Louisiana area one out of three fields inspected was found to be infested with boll weevils. An average of 8 weevils per acre was found with the range being 0–25. Weevil activity was rather low due to low temperatures and dry, windy weather.

During the week of May 20 only one field out of 20 examined in the Mississippi delta area was found to be infested with boll weevils. The infested field averaged 50 weevils per acre. In the Florence, South Carolina area weevil movement was still light by late May due to cool weather.

Thrips caused some damage to cotton during the month. In the Florence, South Carolina area damage was reported and moderate to heavy infestations were recorded in several southern Georgia counties. Thrips were numerous on alternate host plants in the Mississippi delta counties, but movement to cotton was rather slow. Although counts on cotton did not indicate injurious populations, some farmers were applying treatments.

Thrip populations were on the general increase in Texas from the lower Rio Grande valley to Waco. Populations in general were light to medium but some injury was noted in the Waco area and as far north as the Red River. Heavy populations of thrips damaged seedling cotton in untreated fields of Dona Ana county, New Mexico. Cotton stands were being reduced in spots in some fields.

Treatments were applied for ***aphids*** on cotton by many growers in the Florence, South Carolina area. Aphids were present in practically every cottonfield in Allendale county, with some situations being serious. Natural enemies were giving some control. In Arizona and Texas the ***cabbage looper*** was causing foliage damage in localized areas.

The ***pea aphid*** was perhaps the most widespread insect reported on during the month of May. Although the insect was reported generally throughout the country, only a few states recorded heavy populations. Heavy infestations of the pea aphid caused damage to areas of alfalfa in Torrance and Valencia counties, New Mexico. In Kaufman county, Texas, populations on vetch were from medium to heavy with counts up to 700 per 5 sweeps in untreated fields.

Heavy populations of the pea aphid in southeastern Kansas caused many alfalfa fields to be cut early. Deposits of honeydew were heavy in some fields causing cutting to be troublesome. By the latter part of May populations of the insect in southern Illinois were increasing on red clover but decreasing in alfalfa due to fungus disease. Counts up to 1,200 per 100 sweeps were recorded in alfalfa and up to 3,600 per 100 sweeps in clover. In central Illinois populations up to 10,000 per 100 sweeps were recorded in alfalfa.

Although populations of the pea aphid were very high on alfalfa throughout Delaware early in May, populations were decreasing rapidly by the end of the month. Damage was evident in many fields. A fungus disease reduced populations of the pest on alfalfa and red clover in Maryland. Virginia recorded damaging populations with conditions favorable for further buildup. Controls were recommended for the insect in Sandusky county, Ohio where the counts were exceptionally high.

Grasshoppers were hatching in a wide area by late May but very few high populations had been reported by that time. In Bailey county, Texas, counts of ***Aeoloplides turnbulli*** were estimated at 600 per square yard on margins and 100 per square yard in the field. Some hatch was reported as far north as South Dakota and Wisconsin.

During April counts were made for overwintering ***European corn borer*** larvae in several New Jersey areas. The average number of larvae per infested stalk was 2.36 compared with 1.73 in 1959. Outlook for infestations this spring in potatoes and corn is the highest in 6 years. The spring survival survey conducted in Iowa showed the average number of live European corn borer larvae per acre of corn debris in oatfields to be 726 compared with 3,049 in 1959.

The ***alfalfa weevil*** continues to spread in the eastern United States. During recent weeks the insect has been taken for the first time in several east Tennessee counties. Damaging populations of the weevil were reported during late May from the majority of the infested eastern states whereas populations were noneconomic in most of the western states reporting.

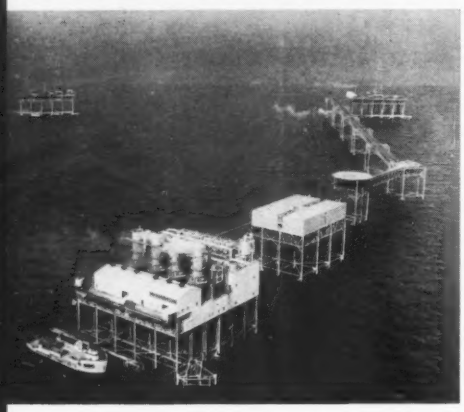
Leaf rollers caused some concern in various orchard areas during May. A serious infestation of the red-banded leaf roller was found in apples in western Washington county, Ohio in early May. Numerous egg masses were also reported from Ashtabula county. The fruit tree leaf roller was a definite threat to apple orchards in the Orleans, Indiana area. Populations were especially heavy in untreated orchards and above normal for well-kept orchards. This species appeared in sufficient numbers in the Carbondale, Illinois area to warrant control.

Among the forest insects ***pine sawflies*** were causing damage in several areas. A serious outbreak of sawflies on shortleaf pine was reported from Union county, North Carolina. Heavy defoliation was reported from Vance county with scattered defoliation from other areas. ▲

* *Chief Staff Officer, Survey & Detection Operations, Plant Pest Control Div., Agricultural Research Service, USDA.*

NEWS OF THE INDUSTRY

FIRST OFFSHORE SULFUR MINE BEGINS OPERATIONS



Commercial operation has begun at the world's first offshore sulfur mine—the largest steel structure ever erected in the ocean. Located seven miles off the coast of Louisiana in the Gulf of Mexico, the one-half-mile-long structure is the principal part of a $30 million Freeport Sulphur Company project to mine a major new sulfur deposit known as Grand Isle.

Units of the island are: the heating plant where boilers, air compressors, pumps and generators supply the necessary mining "tools"; the employees housing facilities which can accommodate 120 men and contain TV and recreation rooms, kitchen, cafeteria, first-aid room and offices; a heliport; and at the far end, the drilling and production platform. The separate drilling installation at the left sinks wells to relieve the ore body of excess mine water.

NEW PRICES ANNOUNCED

Ammonium nitrate. Spencer has announced a price schedule effective August 1 which the company described as containing "modest adjustments." Provided for are seasonal discounts in the off-season months of August through December and a base price for the season commencing January 1 of $70 per ton, f.o.b. plant, compared with current price of $68 per ton. Off-season discounts call for a price of $64 in August and September, and $67 in October, November and December. Increasing costs of raw materials, transportation, labor and warehousing made the price increase necessary, said Byron M. Kern, Spencer vice president of agricultural chemicals.

Anhydrous ammonia. Allied Chemical Corp. has increased its price to $92 a ton from $88, effective October 1.

Nitrogen solutions will be priced at $132 by Allied Chemical effective January 1, 1961. Current price is $128 a ton. Beginning October 1, Uran will sell for $164 instead of $160.

Nitrogen Division of Allied Chemical Corp.'s vice president, M. E. Hunter, announced off-season discounts: From August 1 to Sept. 30, anhydrous ammonia will sell for $84 a ton. Nitrogen solutions will be priced at $126 a ton from July 1 to Dec. 31 and Uran will be discounted at $158 a ton from August 1 to Sept. 30.

PHOSPHATE ROCK INDUSTRY STILL IS EXPANDING

Spurred to phenomenal growth by new markets, the domestic phosphate rock industry can anticipate continued expansion, although at a somewhat slower rate, the Bureau of Mines predicts in a publication just released.

Describing current trends in processing and utilizing phosphate rock, the Bureau's report presents information on output, prices, intermediate products and other features of this industry.

Authors are William H. Waggaman, former commodity industry analyst, and E. Robert Ruhlman, physical scientist.

Information Circular 7951, "Phosphate Rock, 2. Processing and Utilization," is for sale by the Superintendent of Documents, Govt. Printing Office, Washington 25, D. C., at 30 cents a copy.

HOOKER PLANS NEW BUILDING AT NIAGARA

Construction for a new building to house semi-commercial production processes is planned to begin soon at Hooker Chemical Corp.'s Eastern Chemical Div. plant at Niagara Falls, N. Y.

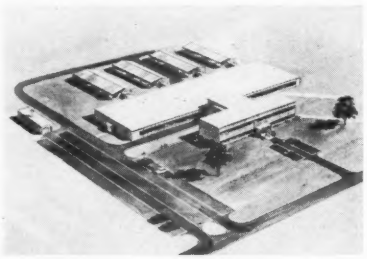
Including equipment, the new facility is estimated to cost about 1½ million dollars. It will permit centralized production of chemicals which have outgrown the pilot plant stage, but have not yet reached commercial-scale volume. Hooker uses an arbitrary range of $25,000 to $100,000 annual sales for a product as being of semi-commercial size.

Completion will be about a year hence.

DIXIE PLANT TO MAKE SUPER

Dixie Fertilizer Co. reported recently that its soon-to-be constructed plant at Meridian, Miss., will make superphosphate at the rate of about 20 tons an hour when in full production, in addition to mixed fertilizers.

NIAGARA CHEMICAL TO BUILD RESEARCH CENTER IN N.Y.



Architect's rendition of new research center for Niagara Chemical Div. includes office unit, lab facilities and four greenhouses extending from the rear.

A research center that will be "one of the most modern of its kind" for pesticide research will be built at Middleport by Niagara Chemical Div. of Food Machinery and Chemical Corp. Construction is expected to begin this summer, according to Division Manager Stuart Bear, who made the announcement.

Included in the new facilities will be laboratories for the identification and measurement of minute chemical residues on crops; an improved organic synthesis section; and expanded biological screening and formulation laboratories.

CSC DIVIDEND

A dividend of ten cents per share was declared May 23, 1960 on outstanding common stock of Commercial Solvents Corp., payable June 30, 1960 to stockholders of record at the close of business on June 3. Previous payment was ten cents per share on March 31, 1960.

POTASH PRODUCERS ESTABLISH INTERNATIONAL FOUNDATION

A new Foundation for International Potash Research has been established by six major potash producers of the United States—American Potash and Chemical Corp., Duval Sulphur and Potash Co., International Minerals and Chemical Corp., Potash Co. of America, Southwest Potash Corp. and U. S. Borax & Chemical Corp. —to develop programs for "efficient and beneficial use of potash" in various countries throughout the world.

Headquarters will be located at 1104—16th St., N. W., Washington, D. C.

Main purpose of the Foundation is to work closely with agricultural authorities of various countries to increase efficiency of crop production, according to Dr. H. B. Mann, president of the new Foundation. Mann, who has been president of the American Potash Institute for the past 12 years, will continue to head the Institute.

To find new markets for the American potash industry has become important, Mann contends, because the industry has developed its production capacity beyond the requirements of North America, now served by the research and educational work of the American Potash Institute.

Vice president of the new Foundation is J. D. Romaine, associated with potash industry research and education work for three decades.

Early activities will center largely in Japan, with some work possibly in Korea and the Philippines, Mann reports. Later plans may include some work in Mexico, Central and South America, the West Indies, Africa and Austral-Asia.

NEW NAME, GREATER AUTONOMY FOR GRAND RIVER

Deere & Co. officers have announced major organizational changes, revised fiscal policies and a change in name for its Chemical operations, heretofore identified as Grand River Chemical Div.

New name is John Deere Chemical Co. In keeping with Deere's decision to extend greater autonomy to this operation, the new company will have its own board of directors and officers.

Directors are E. M. Cook, chairman; L. A. Murphy; Bruce Lourie; W. W. Yeandle and R. B. Ady.

Officers are W. W. Yeandle, president; R. B. Ady, vice president; and K. B. Smith, secretary-treasurer.

Suitable changes on advertising media, packages for products, trucks, cars, tank cars, signs, etc., should be completed by Sept. 1.

ARMOUR OPENS MO. PLANT

Armour Agricultural Chemical Co. recently opened its new liquid and dry fertilizer plant near Centralia, Mo.

Located four miles west of Centralia on U. S. Highway 22, the plant will serve an area within an approximate 50-mile radius of the city.

PETRO-TEX TO BUILD MALEIC ANHYDRIDE PLANT

A multi-million dollar plant to produce maleic anhydride will be built by Petro-Tex Chemical Corp. of Houston, Tex., according to Sidney T. Ellis, president.

The company has developed a new process to produce the chemical using low-cost C4 hydrocarbons as a starting material, Ellis said.

Scientific Design Co., New York, is carrying out engineering and construction work on the plant, scheduled for completion by mid-1961.

Petro-Tex is jointly owned by Food Machinery and Chemical Corp. and Tennessee Gas Transmission Co. of Houston.

CONSUMERS CO-OP EXPANSION

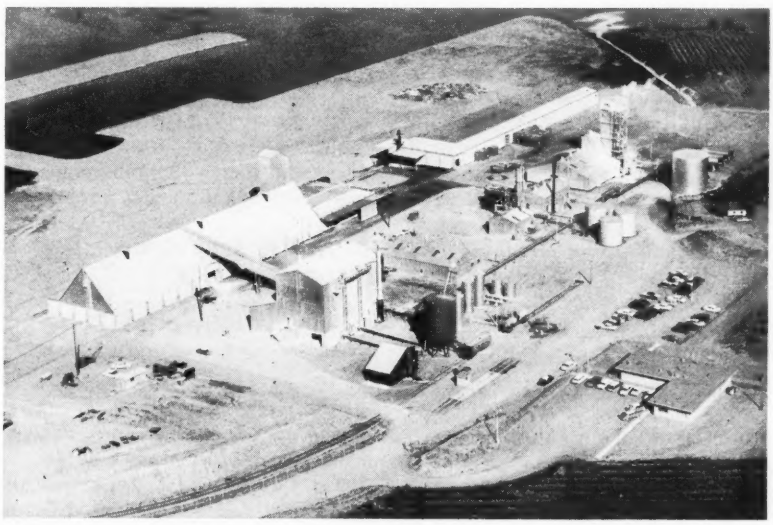
Consumers Co-operative Association has announced an expansion program costing more than $3 million for its nitrogen fertilizer plant at Lawrence, Kansas. New units to be installed: A 100 ton-a-day ammonia unit and an addition to the urea nitrate unit.

The plant is operated as Cooperative Farm Chemicals.

NEW CHEMICAL COMPANY FORMED IN AUSTRALIA

A new, jointly owned chemical company is being formed in Australia by Monsanto Chemicals (Australia) Limited and Consolidated Zinc Pty. Ltd. of Australia.

The new firm will manufacture products in which both companies have common interest. Initially, it will produce fluorocarbons, which presently are not manufactured in Australia. To be located at the Monsanto firm's present plant site at Sydney, the new company's manufacturing unit is expected to be operating by mid-1961.



Aerial view of the new $4.6 million California Spray-Chemical Corp. plant food plant at Kennewick, Wash. shows new docking facilities. Howard J. Grady, Calspray president, presided at the "Dedication Day" ceremonies May 17 and introduced to the guests, members of the Western Governors Conference who toured the plant. The plant manufactures ammonium nitrate, ammonium nitrate solutions and high analysis nitric phosphate complex fertilizers.

AIR POLLUTION MONITORING SYSTEM AT BREWSTER DESCRIBED

American Cyanamid Company has found that an air pollution monitoring system begun five years ago at its Brewster, Florida, phosphate plant has been an indispensable tool in determining control measures necessary for maximum production without air pollution. Additionally, the project has helped improve the plant's community relations.

So reported Charles R. McHenry, an industrial hygienist in Cyanamid's central medical department, in a paper delivered to members of the Air Pollution Control Association at its recent annual convention in Cincinnati, Ohio.

He described the unique procedures initiated in 1956 when Cyanamid decided to build a triple superphosphate facility in an expansion of its Brewster operations.

"Fluoride contamination is of increasing public concern, and the phosphate fertilizer industry is one whose manufacturing operations emit fluorides," McHenry noted. A major part of the U. S. phosphate industry is concentrated in Florida.

Cyanamid's approach to ensure reduction of fluoride emission consists of three phases:

First: incorporation of certain engineering controls in the blue print specifications of the new plant.

Second: undertaking a five-year environmental study still in progress, that includes continuous monitoring of fluoride content of air and water, soil samples and vegetation, and collection of meteorological data. This study, begun one year before the triple plant went into production, is being used to determine the efficacy of initial controls and the need for additional controls.

Third: final evaluation of data obtained by monitoring, which will be made available to industry, government and other specialists concerned with air pollution.

Cyanamid's comprehensive monitoring program is regarded as the most extensive undertaken in the phosphate industry. For example, in carrying on atmospheric sampling, four continuous and dynamic sampling stations and 18 static sampling stations are located at distances up to 20 miles from the plant, McHenry reported. A complete meteorological monitoring station was also set up.

Cyanamid to date has spent more than $1,400,000 in studying and effecting air pollution control, it was stated.

Participating in the Brewster monitoring program with McHenry are Hoyt Charles, agriculturist; Dr. W. A. Rye, plant physician; and Arthur Crago, plant manager.

PENICK FARM CHEMICAL DIV. MOVES TO ST. LOUIS

To facilitate further expansion, the Farm Chemical and Insecticide Div. of S. B. Penick & Co. is establishing new headquarters in St. Louis July 1, according to Frank Seeland, vice president in charge of the division. The new location is 4161 Beck Avenue, St. Louis 16, Mo.

Products sold by the division will be stocked at St. Louis, providing one more shipping point in addition to those existing for all divisions in New Jersey, Chicago and on the West Coast.

Main office is located in New York City.

MONSANTO STARTS UP NEW NITRO HERBICIDE PLANT

Monsanto Chemical Co. has announced start-up of a manufacturing unit in Nitro, W. Va. which more than doubles the company's previous capacity for producing two of its newest weed killers.

Avadex is a pre-planting herbicide for control of the wild oat, and Vegadex gives control of annual grasses and certain broad-leaf weeds in vegetables and some ornamentals.

A. H. GEE SPEAKS ON FOOD ADDITIVES

"Food Additives—The Real Problem" was the subject of an address by Dr. A. H. Gee, director of bacteriology and toxicology for Foster D. Snell, Inc., at the May 11 meeting of the New York Professional Chapter of Alpha Chi Sigma.

Dr. Gee is widely known as an expert on technological and legal aspects of new legislation affecting food additives as well as that contemplated for precautionary labeling.

THREE FIRMS PLAN WEST COAST FERT. PLANT

Stauffer Chemical Co., Shell Chemical Co. and Western State Chemical Corp. have announced plans to form a new company to produce a full line of complex solid fertilizers for the Western market.

The plant will be located adjacent to the Stauffer Chemical plant at Dominguez, Calif., and will be in operation in early 1961. Plant capacity will be in excess of 50,000 tons per year, and the output will supply nitrogen, phosphate and potash fertilizers for California and other Western states.

NEW CANADIAN OFFICE

Nelson Cannon has been named general manager, Canada, for Roger Williams Technical & Economic Services, Inc. He will be in charge of the branch of this firm's office at 170 Donway West, Don Mills, Toronto, Canada.

AGREEMENT SIGNED FOR NEW UREA PLANT

An agreement has been signed between Montecatini and Uniao Fabril do Azoto of Portugal for construction of a 40,000 metric tons per year urea plant at Labradio, near the town of Barreio on the Tagus River. It will be the 34th major industrial unit using the Fauser-Montecatini process for urea manufacture.

The plant is being engineered by M. W. Kellogg Co.

WITCO DIRECTORS VOTE 50% COMMON STOCK DISTRIBUTION

Shareholders of Witco Chemical Co., Inc. approved an increase in the company's authorized common stock to 2,000,000 shares from the present 1,000,000 shares at their recent annual meeting.

Based on this approval, the Witco board of directors has voted a 50% stock distribution, increasing total outstanding common stock to about 1,210,000 shares.

An increased cash dividend also was voted by the board for the third quarter of 1960 at the rate of 20 cents per share on the larger number of shares outstanding. This dividend is equivalent to 30 cents per share before the stock distribution.

READER SERVICE

FREE INFORMATION to help you solve fertilizer, pesticide problems

Chemicals

203—SOHIO UREA

Sohio Chemical Co. suggests that you fill out your fertilizer line with Sohigro Urea. It delivers 45 per cent actual nitrogen, is prilled, free-flowing and easy to apply, Sohio reports. Information on the product is readily available. Just

CIRCLE 203 ON SERVICE CARD

204—DAIRY CATTLE SPRAY BULLETIN

A new bulletin from McLaughlin Gormley King Co. describes specific formulations that can be made from concentrates containing Cow-Tent Repellents and synergized pyrethrins. Specific test work that has been performed on various formulations is described, and a history of repellents is given. Free copies are available. Just

CIRCLE 204 ON SERVICE CARD

205—STROBANE

Information on Strobane cotton insecticide is available from Heyden Newport Chemical. When combined with DDT, Strobane is very effective for control of most cotton insects, and has shown good control of resistant boll weevil. For a folder describing the insecticide,

CIRCLE 205 ON SERVICE CARD

206—INSECTICIDE GUIDE

A compact guide on Thiodan insecticide has been published by Niagara Chemical Div. of Food Machinery and Chemical Corp. The guide features an easy-to-read chart on how to use Thiodan. Suggested amounts for control of specific pests, time of application and other pertinent data are listed by individual crop. Also described are general properties, compatibility, various formulations now available. You can obtain a copy by

CIRCLING 206 ON SERVICE CARD

207—FERRO F.T.E.

Six minor elements are combined in FTE (fritted trace elements), according to Ferro Corp.—boron, iron, manganese, zinc, copper and molybdenum. And as little as 1% to 1½% FTE in mixed fertilizers has proven effective, Ferro says. An eight-page booklet available from the manufacturer provides additional information. You can obtain a copy by

CIRCLING 207 ON SERVICE CARD

208—KOLKER'S METHYL BROMIDE

Information on methyl bromide is offered by Kolker Chemical Corp. Packaged in one-pound cans with 2 per cent chloropicrin as warning agent, and 50, 150 and 450 pound cylinders of 100% methyl bromide, the fumigant is reported to kill insects, mites and related pests in all stages of development. For details,

CIRCLE 208 ON SERVICE CARD

209—PYROPHYLLITE

Glendon Insecticide Grade Pyrophyllite is the subject of a four-page brochure from Carolina Pyrophyllite Co. Ground so that 92 to 95 per cent will pass a 325 mesh screen, the product has a pH range of 6 to 7, is non-hygroscopic. A copy of the brochure will be mailed to you, if you

CIRCLE 209 ON SERVICE CARD

210—INSECTS IN STORED GRAINS

A ten-page booklet entitled "Better Control of Insects in Stored Grains" has been published by Stauffer Chemical Co. Among the subjects discussed are grain protectants, fumigants and sanitation methods. One feature of the booklet is a handy wall chart which includes identifying sketches of principal stored grain insects. Copies are available without charge.

CIRCLE 210 ON SERVICE CARD

211—FACTS ABOUT PYRETHRUM

A booklet, "Facts About Pyrethrum" is available from Chas. Hurd Associates, information representatives for African Pyrethrum. Containing eight pages, it lists products which contain pyrethrum, advantages, names and addresses of American refiners and other information on pyrethrum. To get a copy

CIRCLE 211 ON SERVICE CARD

212—TERRACLOR

Complete information on Terraclor for control of soil-borne diseases is offered to formulators by Olin Mathieson Chemical Corp. The soil fungicide is available as 75% wettable powder, 2-lb. emulsifiable, and dust formulations. For details, just

CIRCLE 212 ON SERVICE CARD

213—PROTOX EMULSIFIERS

A ten-page technical bulletin on suggested formulations with Protox emulsifiers has been prepared by Process Chemicals Co. Protox 7300 and 7400 are used with chlorinated toxicant systems; Protox 7227 was developed for use with parathion and malathion. For your copy of the technical bulletin, simply

CIRCLE 213 ON SERVICE CARD

Process Equipment

214—BULK BLENDING BROCHURES

Availability of brochures on bulk blending equipment, building and a combination bulk-blend warehouse operation has been announced by Fertilizer Engineering & Equipment Co. The brochures describe engineering improvements, dimensions, details and prices. Other features include a centralized control point, building data and information on turnkey contracts. For complete information,

CIRCLE 214 ON SERVICE CARD

215—COMPLEX FERTILIZER BULLETIN FROM C&I

"Complex Fertilizer" is the title of a new bulletin from The Chemical and Industrial Corp. The bulletin says that C&I complex fertilizer plants combine the proven PEC acidulating ammoniating section with C&I's patented spherodizer to assure a superior pelleted product with low recycle. A flow chart is included. To obtain a copy,

CIRCLE 215 ON SERVICE CARD

216—CB&I EVAPORATORS

Evaporators—both single and multiple effect—are described in a new 28 page bulletin published by Chicago Bridge & Iron Co.'s Process Equipment Div. Liberally illustrated, the bulletin covers the design and function of various types of the units used in the evaporation of solvents and the concentration of many chemical solutions. Free copies may be obtained by

CIRCLING 216 ON SERVICE CARD

217—FOXBORO MAGNETIC FLOW METERS

The Foxboro Co. says its magnetic flow meter was developed to meet industry's need for a fluid flow meter which measures volume rate of "difficult or impossible" fluids, such as corrosive acids, sewage, rock and acid slurries. A 12-page, 2-color bulletin from the company illustrates and describes principles of operation of the transmitter and receiver and provides specifications. For yours,

CIRCLE 217 ON SERVICE CARD

how to use the READER SERVICE CARD

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- *Print or type your name, position, company and address*
- *Clip and mail the Service Card*

See pages 45, 50, 51 and 52 for information on these Reader Service numbers:

232—Fire-Snuf Panels
233—New Uramon Solution
234—Samincorp. Seed Disinfectant
235—Hydro-Volute Scrubber
236—New Bucket Elevator
237—Barrington Jet Mixer
238—Sturtevant Pulver-Mill

Packaging

218—BAG CLOSING

George H. Fry Co. reports its Model CSG bag closer is ideal for closing small square or flat paper bags containing insecticides, fertilizers, and other granular products. It double-folds, heat seals and glues on heavy-weight coated or lined paper bags, and the closing operation is continuously automatic. A free brochure is available. Just

CIRCLE 218 ON SERVICE CARD

Materials Handling

219—H-25 PAYLOADER

For maximum continuous production in close quarters, The Frank G. Hough Co. recommends use of the Model H-25 Payloader. Turning radius is 6 feet, and operating capacity is 2,500 pounds. The unit has full power-shift transmission and power steering. Literature containing complete information will be yours, simply by

CIRCLING 219 ON SERVICE CARD

220—RAYMOND "PAL JAC"

Raymond Corp. has added an economy model to its line of hydraulic hand pallet trucks. Named "Pal Jac," the model is offered in two standard widths, 21" and 27" with fork lengths of 32", 36", 42" and 48". It has a capacity of 2200#. Booster rolls at the ends of the forks facilitate easy pallet entry, Raymond says, and a tapered runner helps the forks to slide out of the pallet smoothly. Literature is available by

CIRCLING 220 ON SERVICE CARD

221—TANK TRUCK HAULING

A new, 6-page fold-out brochure entitled "Series 53 and 71 Engines for Profitable Tank Truck Hauling" is available from the Detroit Diesel Engine Div. of General Motors Corp. In addition to illustrations and dimensions of Detroit Diesel's 6V-53, 6V-71 and 8V-71 engines, the new brochure gives complete horsepower data on the division's 97 to 290 HP automotive engines covering in-line and Vee models. Copies may be obtained by

CIRCLING 221 ON SERVICE CARD

222—NEW PALLETIZER

A new pallet loading machine permits high speed one-man loading of standard pallets for transporting by fork lift truck, reports Power-Curve Conveyor Co. The powered turntable station is used with a standard Power-Curve flexible loader and swivel stacker. Bags are power propelled into position on the pallet with the machine operator guiding each bag, using any palletizing pattern. When a pallet is loaded, the turntable is power-rotated to position a new pallet while the loaded pallet is removed by fork lift. More than 1,000 bags an hour can be palletized by one man, the manufacturer says. For a bulletin describing the machine,

CIRCLE 222 ON SERVICE CARD

Application Equipment

223—HILLER 12E

Hiller Aircraft Corp.'s new 12E helicopter has 305 hp, is reported to be the most powerful in its class. Among its features: At the turning point of each run an integral suck-back system built into the 12E's agricultural accessories actually reverses the flow in each spray boom. This reverse draining prevents damage to susceptible crops in adjacent fields, Hiller says. For information on the 12E,

CIRCLE 223 ON SERVICE CARD

224—THE ROTO-WERL

First winning acceptance on golf courses, the Roto-Werl spreader is now used extensively on farms and in highway maintenance, reports Hatfield Spreader Corp. It offers 15–35 ft. coverage (depending on materials used), spreads 10 acres or more per hour. Among the materials it applies are fertilizers, fungicides, insecticides, herbicides, seed, salt, sand and cinders. Specifications and complete information are contained in literature, yours by

CIRCLING 224 ON SERVICE CARD

225—CATALOG OF NOZZLES AND ACCESSORIES

Spraying Systems Co. spray nozzles for farm, ranch, orchard and garden spraying are covered in a new catalog from the company. Included are TeeJet spray nozzles for boom and broadcast spraying of herbicides, insecticides and fertilizers; row crop spraying of insecticides; roadside spraying; flow regulators; fittings; shut-off valves; spray guns; line strainers and suction strainers. For your copy of the 20-page catalog,

CIRCLE 225 ON SERVICE CARD

226—AERO-DYNE FOLDER

A free folder from Dakota Aviation Co. describes the Aero-Dyne aircraft sprayer, available for Piper models J-3 through PA-18 and Champion. Made in four different models, the Aero-Dyne is constructed of lightweight fiberglass. Features reported by the manufacturer include: tank filling from either side, unique construction eliminates 80 inches of boom drag, easy installation. Get more information by

CIRCLING 226 ON SERVICE CARD

227—PUMPS FOR LIQUID FERTILIZERS

Eight pump models offered for handling complete mix fertilizer solutions are covered in literature from Gorman Rupp Co. Illustrations, specifications and performance curves are included for liquid mix, aqua ammonia and nitrogen solutions pumps. For your free copy

CIRCLE 227 ON SERVICE CARD

Miscellaneous

228—ANTIOXIDANT FOR INSECTICIDES

Applications of Tenamene 3 (2,6-ditert-butyl-p-cresol) as an industrial antioxidant are discussed in a new 16-page brochure available from Eastman Chemical Products, Inc., subsidiary of Eastman Kodak Co. Performance charts and graphs illustrate the effectiveness of Tenamene 3 as an antioxidant for such materials as lubricating oils, elastomers, polyethylene and insecticides. Copies can be had by

CIRCLING 228 ON SERVICE CARD

229—WALK-IN ENVIRONMENTAL TEST ROOMS

Labline, Inc. has a new line of walk-in environmental rooms with two temperature ranges: ambient to 140° F. and 0° to 140° F. Accuracy is maintained within ± 1° F. The test rooms are constructed in panel form, shipped knocked down to permit easy access through narrow doorways. They are quickly assembled, Labline reports. All models have fully enclosed heating elements and come in a number of stock sizes. Full information can be found in a bulletin, yours by

CIRCLING 229 ON SERVICE CARD

230—LABORATORY-SIZE VIBRATING SCREEN

Designed for research laboratory, production-control lab, and pilot-plant use, the new Bartlett-Snow Type CDP 8-in. circular screening unit features quiet operation. Readily carried by one man, the unit is reported to be ideally suited for screening granular, crystalline, powdery or other dry materials, even through 200, 325 and 400 mesh. Details are available. Simply

CIRCLE 230 ON SERVICE CARD

231—LAB SERVICES

A bulletin from Crippen Laboratories, Inc. describes its agricultural chemicals testing services. Prices of analysis are included for insecticides, fungicides, herbicides, rodenticides and fertilizers. Special services offered by the firm also are listed. For your copy

CIRCLE 231 ON SERVICE CARD

MONSANTO ADDS TO PARATHION & METHYL PARATHION PLANT

Early in June, Monsanto Chemical Co. reported construction had begun at Anniston, Ala., on a 50 per cent expansion of its manufacturing plant for parathion and methyl parathion. Scheduled to be complete in November, the expansion will give the plant an annual capacity of 18 million pounds of these products.

Maximum safety precautions for operating personnel which were designed into the construction of the Monsanto plant in 1957 also are being incorporated into the addition, said J. Paul Ekberg, director of agricultural chemicals for Monsanto's Organic Chemicals Div. Among the precautions are multiple instrumentation controls on each process step, isolation of reactor vessels behind steel-reinforced concrete block walls, provisions for automatic kettle dumping and a deluge system which is triggered by any excessive temperature rise.

Ekberg said that the increased capacity is needed to accommodate rapidly expanding use of these compounds, up more than 50 per cent in the past two years.

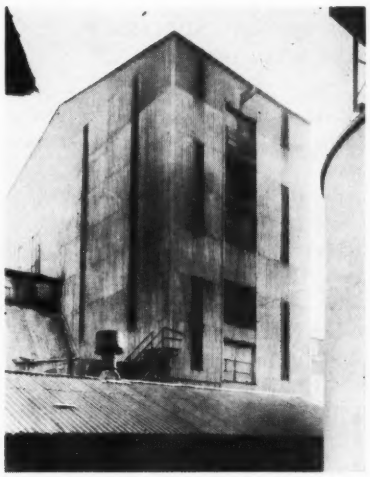
SMITH-DOUGLASS 9-MO. SALES AND EARNINGS

Net sales of $40,337,557 and net income of $2,973,761 for the nine-month period ending April 30, 1960, were reported recently by Smith-Douglass Co. This compares with sales of $35,364,539 and net income of $2,341,936 for the same period last year. Earnings per common share were $2.94, compared to $2.36 in 1959.

ARCHER-DANIELS-MIDLAND ANNOUNCES NEW PLANT

Plans for a multi-million dollar chemical plant to be built near Peoria, Ill., have been announced by Archer-Daniels-Midland Co.

The installation will include plants producing nitrogen chemicals, plasticizers, esters, olefins and other chemicals, according to John H. Daniels, president. Construction will begin in late summer or early fall, and start-up of operations is scheduled for the spring of 1962.



DECIDED DIFFERENCE. Recent installation (19,300 square ft.) of fiberglass-reinforced polyester panels has markedly improved structural appearance, corrosion resistance, and "wearability" of the acid-processing section in a midwestern fertilizer plant. At left, felt-and-asbestos-covered, zinc-coated protective panels, installed in 1954 when the building was erected, show the ravaging corrosive effects of heat, humidity, moisture, acid fumes, fertilizer dust and equipment vibration after four years' service. At right, the same structure as refurbished with grey opaque, fiberglass-reinforced plastic panels. Made by the Resolite Corp., of Zelienople, Pa., these Fire-Snuf panels were fabricated from Hetron 93-LS, a corrosion-resistant, fire-retardant polyester resin produced by Durez Plastics Div. of Hooker Chemical Corp. The manufacturer reports that before the paneling was installed, it was tested continuously for three years by actual plant exposure as well as by immersing sample strips in various acids at various temperatures. More information on the panels is available by circling 232 on the Reader Service Card.

EGYPT TO GET FERTILIZERS FROM ASWAN DAM

President Nasser of Egypt recently switched on the first of seven main and two auxiliary turbines of the hydro-electric installation on the existing Aswan Dam on the River Nile, most of whose power will be used in the Kima plant of Egyptian Chemical Industries Co. in producing fertilizers. The rest of the new station's output will be supplied to the site of the Nile high dam, work on which was officially inaugurated by President Nasser.

According to the Hydro-Electric Power department of the Egyptian Ministry of Public works, which is operating the Aswan scheme, the total average annual energy available from the scheme, based on discharges and levels of water which are likely to prevail during the first stage of the Saad El Aali scheme, will amount to about 2,500 million kwh. Of this energy, about 1,740 million kwh will be utilized by the Kima plant to produce about 565,000 tons of ammonium nitrate, containing 20.5 per cent nitrogen.

Production of this quantity of fertilizer will save the Egyptian economy an annual importation of a like amount of fertilizer costing about $40 million in foreign currency.

TEXAS GULF DIVIDEND

Texas Gulf Sulphur Co.'s board of directors has declared a regular quarterly dividend of 25 cents per share on the 10,020,000 shares of the company's stock in the hands of stockholders.

The company's 155th consecutive quarterly dividend was payable June 15 to stockholders of record May 31.

CALSPRAY FACILITY NEARS COMPLETION

California Spray-Chemical Corp. is nearing completion of its new Yuba City, Calif. office and warehouse.

In addition to office and warehouse facilities, the new building of "tilt-up" type construction will house an aqua converter for converting anhydrous ammonia to aqua ammonia, a mix plant to produce liquid fertilizers, and tank storage facilities for ammonium nitrate and calcium ammonium nitrate solutions.

Contractor is C. A. Otto and approximate cost $120,000.

TGS REPORTS SUCCESSFUL TEST WELL IN UTAH

Texas Gulf Sulphur Co. announced in June favorable results from its first test well on potash leases in southeastern Utah. The well was completed one month after the signing of an agreement under which Texas Gulf will acquire and commercially develop the extensive Utah potash properties of Delhi-Taylor Oil Corp. The latter will retain a 25 per cent interest.

"The test results were consistent with earlier estimates of the thickness and grade of the potash strata," according to Claude O. Stephens, Texas Gulf president. A second well is nearing the coring stage and a third rig is being moved on location to accelerate the test program. Drilling is taking place in the Cane Creek Anticline area.

Texas Gulf used compressed air rather than mud as the drilling and coring medium This technique speeded drilling, eliminated leaching and led to 100 per cent core recovery in the potash zone, the company said.

SMITH-DOUGLASS PLANT COMMENDED BY COUNCIL

The National Safety Council has presented its Certificate of Commendation to the South Norfolk tankage plant of Smith-Douglass Co., Inc., for its excellent safety record.

Howard Pyle, president of the Council, in a letter of congratulations to W. E. "Jack" Lee of Smith-Douglass, explained that the plant qualified for the award because of its injury-free period of 382,366 man-hours from February 6, 1955 to December 31, 1959.

JAPANESE FIRM TO SUPPLY IMC WITH PHOSPHATE CHEMICAL

The Onoda Fertilizer Manufacturing Co. is reported to have signed a contract to supply reflorinated tricalcium phosphate to International Minerals & Chemical Corp. during the next five years.

About 11,000 tons of the product would be shipped during the initial year beginning October, 1960. Eventually the annual export shipment would be increased to 50,000 tons, the report said.

Onoda said the export price was fixed at $82 per ton, c.i.f. basis.

STEPAN CHEMICAL REPORTS ON THE FIRST QUARTER

Increases in sales and earnings were reported by Stepan Chemical Co. for the first three months of 1960, compared with the same period in 1959.

Sales for the three months ended March 31, 1960, totaled $4,983,049, compared with $3,474,643 for the same period in 1959.

Earnings for the first three months of 1960 reached $236,927 or 35 cents a share, compared with $155,922 or 24 cents a share for the comparable 1959 period.

ALLIED TO INCREASE EXPENDITURES IN THE 60's

Allied Chemical Corp. President Chester M. Brown reports that accelerated expansion of research and new plants in the 1960's will exceed the company's $700 million capital expenditures of the last decade.

Its participation in the major fields of chemicals for agriculture, construction, synthetic fibers and plastics will be increased.

Associations
Meetings

FOREST FERTILIZATION RESEARCH GRANTS

Six grants for forest fertilization research in the South have been provided by the National Plant Food Institute, Dr. Robert L. Beacher, director of NPFI's southern region, announced recently.

Principal scientists receiving financial support from the Institute and the studies involved are:

Dr. T. E. Maki, N. C. State College—to continue studies on effects of fertilization of forest trees in organic soils of the Southeastern coast.

Dr. F. W. Woods, Duke University—to initiate experiments on location of nutrient feeder roots of pines growing in deep sands.

Dr. Louis Metz, Southeastern Forest Exp. Station, U. S. Forest Service, to further investigate the possibility of using foliar analysis as a means of determining the nutritional status of southern pines.

George Sparrow, Tidewater Agr. Exp. Station, USDA—to continue research on the interaction of ferti-

Calendar

July 11-13. Western Society of Crop Science, University of Nevada, Reno.
July 13-15. Eleventh Annual Fertilizer Conference of the Pacific Northwest, Hotel Utah, Salt Lake City.
July 20-21. Summer Lime and Fertilizer Conference, Otesaga Hotel, Cooperstown, N. Y.
July 27-30. Southwest Fertilizer Conference and Grade Hearing, Galvez Hotel, Galveston, Tex.
Aug. 2-3. Ohio Pesticide Institute Meeting, Ohio Agricultural Experiment Station, Wooster, Ohio.
Aug. 10-11. Northeast Regional Fertilizer Safety School, Park Sheraton Hotel, New York City.
Aug. 16-17. Midwest Regional Fertilizer Safety School, National Safety Council Headquarters, Chicago, Ill.
Aug. 21-25. Canadian Fertilizer Association Annual Convention, Manoir Richelieu Hotel, Murray Bay, Quebec, Canada.
Aug. 25-27. Southeast Regional Fertilizer Safety School, Wilmington, N.C.
Aug. 25-27. Mississippi Soil Fertility & Plant Food Council, 1960 meeting Buena Vista Hotel, Biloxi, Miss.
Sept. 12-14. Canadian Agricultural Chemicals Assn. Annual Meeting, Britannia Hotel, Lake of Bays, Muskoka, Ontario, Canada.
Sept. 24-26. Western Agricultural Chemicals Association 31st Annual Meeting, Palm Springs Riviera Hotel, Palm Springs, Calif.
Sept. 27-29. National Agricultural Chemicals Association Annual Meeting, Hotel del Coronado, Coronado, Calif.
Sept. 29-30. Northeast Fertilizer Conference, Hotel Hershey, Hershey, Pa.
Oct. 5-6. Southeast Fertilizer Conference, Atlanta Biltmore Hotel, Atlanta, Ga.
Oct. 10-11. Four-State Aerial Applicators Conference, sponsored by Norkem Corp., Hotel Chinook, Yakima, Wash.
Oct. 17-18. National Safety Council, Fertilizer Section, National Safety Congress, Chicago, Ill.
Nov. 2-4. Fertilizer Industry Round Table, The Mayflower, Washington, D. C.
Nov. 3-4. Annual Convention, Pacific Northwest Plant Food Assn., Boise, Idaho.
Nov. 9-11. National Fertilizer Solutions Association, Peabody Hotel, Memphis, Tenn.
Nov. 13-15. 37th Annual California Fertilizer Association Convention, del Coronado Hotel, Coronado, Calif.

lizer applications with irrigation and drainage.

Dr. John Hamilton, Univ. of Ga. —to further determine the effects of fertilizer applications on the wood properties of Southern pines.

A fund has been set aside for commercial nutrient analyses of plant tissues.

FERTILIZER INDUSTRY HOLDS SAFETY TRAINING SCHOOLS

All fertilizer companies have been invited and strongly urged to be represented by as many supervisory people as possible at the upcoming regional safety training schools.

In 1958 and in 1959 the National Plant Food Institute, in cooperation with the National Safety Council, sponsored five regional schools on accident prevention in fertilizer plants. Because of their success, the schools are again being held this year, reports Elmer C. Perrine, chairman of the Fertilizer Section of the National Safety Council.

The schools are scheduled as follows:

Northeast region: August 10–11 at the Park Sheraton Hotel, New York City. Director: Stratton McCargo, G.L.F. Soil Building Service, Ithaca, N. Y.

Midwest: August 16–17 at National Safety Council Headquarters, Chicago, Ill. Director: Emerson Jones, Allied Chemical Corp., Indianapolis.

Southeast: August 25–27 at Cape Fear Hotel, Wilmington, N. C. Director: Quentin Lee, Cotton Producers Assn., Atlanta, Ga.

Far West: In late October or early November at the Hacienda Motel, Fresno, Calif. Director: Austin Cline, Shell Chemical Co., Ventura, Calif.

Southwest: Late October or early November in New Orleans, La. Director to be announced.

The safety training schools are exactly what they imply, the council said. They are not conferences, but should be considered an integral part of management training. Among the subjects covered are "The Scope of Safety Work"; "Safety Education and Training Fundamentals"; "Know Your Accident Problems, Elements, Sources and Effective Measures for Preventing Accidents"; "Safety Organization—The Leadership and Responsibility for Establishing an Effective Safety Program"; "The Supervisor as a Teacher and a Leader"; and "The Handling of Liquid Materials in the Fertilizer Mixing Program."

"You cannot run safer plants by merely buying more insurance," says Stratton McCargo. "If active safe programs are not carried out, then the fertilizer industry can expect to continue to carry a costly record of accidents. Here is the chance to get in on a healthy concentrated effort to stop these accidents and prove that the fertilizer industry can have a good, respectable record of safety."

CONFERENCE ON FARM CHEMICALS HELD IN UTAH

Fifty years ago, about the closest a farmer got to chemistry was to buy a prescription at the local drugstore. Today chemistry plays a vital role in his business and the quality of his output, said Dr. Carl Frischknecht, extension director, Utah State University. Dr. Frischknecht made the statement in examining modern trends of farming during a special agricultural chemicals conference conducted in the Utah capital, Salt Lake City.

Merchandising, distribution and use of agricultural chemicals and regulations involved were discussed by more than 125 representatives of various statewide groups. The meeting was sponsored by the Utah State Department of Agriculture, the Utah Cooperative Extension Service, the Utah Canners Assn. and the Utah Canning Crops Growers.

"We cannot maintain today's high standard of living without the use of agricultural pesticides and other farm chemicals," said Dr. W. H. Bennett, dean of agriculture, Utah State University, in summing up findings of the conference.

Dr. Roy Hansberry, assistant director of the Shell Oil Co. development division, spoke on behalf of chemical manufacturers.

Other speakers at the conference included Ariel Jorgensen, state commissioner of agriculture, who outlined the responsibilities of his department and those of spray operators and salesmen; Joseph Street, professor of animal husbandry at USU, who discussed principles of the use of chemicals, and Dr. George Knowlton, USU extension entomologist, who explained the role of the university in agricultural chemistry education.

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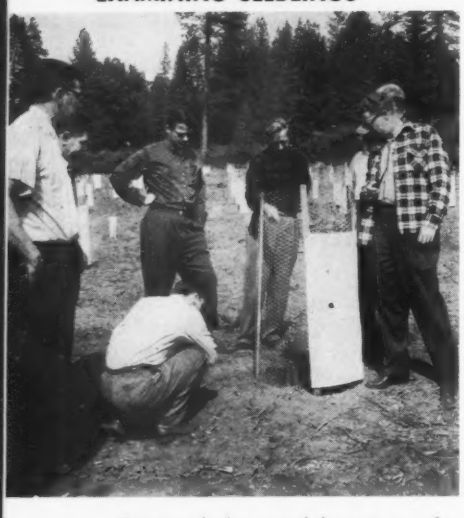
EXAMINING SEEDLINGS



Some of the participants at the recent Soils and Forest Management Field Seminar, arranged by the National Plant Food Institute and the University of California School of Forestry, examine seedlings in the new wire-protected sugar pine seed orchard of the U. S. Forest Service near Placerville, Calif. In the orchard, selected vigorous sugar pine seedlings are protected from intense sun and deer and rodents.

Standing, left to right, are F. Todd Tremblay, Pacific Northwest regional director, NPFI; John Callaghan, Western Forest Protective Assn.; L. H. Gould, Shell Chemical Co.; Dr. Paul Zinke, Univ. of Calif. School of Forestry; and Art Scarlett, farm advisor, Plumas county. Directly behind Scarlett stand R. L. Luckhardt, Collier Carbon and Chemical Corp., and L. Osborne, farm advisor, Yuba county.

The school was arranged by Dr. Richard Bahme, Western regional director of NPFI, and Ed Gilden, U. of C. School of Forestry.

NEW NSC BOOKLETS

A new volume of "Five Minute Safety Talks for Foremen" written by Robert L. Moore, superintendent of engineers for Kemper Insurance Co., has been published by the National Safety Council. Tenth in a general industrial safety series, the book is divided into sections on motivation, machines and tools, materials, movement and managing men.

"Vacation Bound," a multi-color lighthearted presentation of some of the hazards vacationists encounter, also is available from the Council. Main hazards stressed in the eight-page pamphlet are those vacationists encounter while swimming, boating or driving.

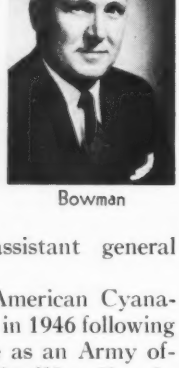
Further information and quantity prices on "Five Minute Safety Talks for Foremen" and a single free copy of "Vacation Bound" are available from National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

People

American Cyanamid Co. Clifford D. Siverd has been named general manager of American Cyanamid Co.'s Agricultural Div. He succeeds Frank S. Washburn, son of the founder of Cyanamid, who will retire in September. Until that time, Washburn will serve as special assistant to Kenneth H. Klipstein, executive vice president, to help effect the changeover of management in the division.

B. F. Bowman, currently marketing director of the division,

Siverd



Bowman

moves up to assistant general manager.

Siverd joined American Cyanamid as a salesman in 1946 following five years' service as an Army officer during World War II. In 1949 he was named assistant to the general manager of the Pigments Div., in 1956 became assistant general manager of the Fine Chemicals Div. and in 1957 was appointed assistant general manager of the Farm and Home Div. When the Phosphates and Nitrogen Div. was merged with the Farm and Home Div. in 1958 to form the Agricultural Div., Siverd became assistant general manager of the new division.

Bowman joined Cyanamid as general sales manager of the Fine Chemicals Div. in 1954. He became marketing director of the Agricultural Division in 1958.

American Potash & Chemical Corp. M. E. McCollam, recently retired director of the American Potash Institute, has been named consulting agronomist by AP&CC, reports W. M. Clines, general sales manager, Western. McCollam held the post of agronomist at Washington State College's West Washington Experimental Station for nine years before his association with the potash industry in 1929. He was with the American Potash Institute from 1935 to his retirement January 1 of this year.

Atlas Powder Co. Charles C. Gammons, vice president, retired June 1 under terms of the company's pension plan. He remains a member of the board of directors and of the executive committee.

In announcing Gammons' retirement, Atlas president Ralph K. Gottshall noted that the company's board of directors had passed a resolution expressing its "deep appreciation for his 26 years of loyal service to the company and noteworthy contribution to its management."

California Spray-Chemical Corp. R. C. Yapp, district manager, Midwest territory, has announced appointment of Joseph A. Aimar as assistant to the district manager. Aimar formerly worked at the Calspray main office in Richmond as budget supervisor, Advertising Div.

New sales representatives: Charles J. Miller, who will work out of the Wenatchee branch, serving growers in the Brewster area; William Plenge, Jr., who will operate out of the Inwood, W. Va. branch office; and Robert L. Nelson, Jr., who will serve the Ukiah, Calif. area.

Century Chemical Corp. has named Philip H. McLaughlin as general sales manager. He will be responsible for all phases of the company's sales and marketing activities including planning, organization and coordination. Before joining Century, he was manager of the Sales Dept. and the Techni-

al Service Dept. of Stauffer Chemical Co.

Diamond Alkali Co. Kenneth L. Lyttle becomes advertising manager, a newly-created position in Diamond's General Sales Dept. Lyttle will assist the company's seven divisions in formulating their advertising and promotional objectives. Then, in liaison with Fuller & Smith & Ross, Inc., advertising agency, he will assist in executing divisional and corporate advertising and sales promotion programs.

He had been with American Steel & Wire, Div. of U. S. Steel.

Robert G. Dow has been appointed field salesman for the Chicago branch sales office. He joined Diamond in October 1955 as a technical serviceman in the company's Research Dept., Painesville, O.

Dow Chemical International Ltd. S.A. Dr. Wendell R. Mullison has been assigned new responsibilities as product manager in charge of international sales of herbicides, soil fumigants and space and commodity fumigants. In this new position, Mullison will be responsible for marketing policies and programs, new product development and technical service. He also will assist the field sales force in analyzing markets, training Dow agricultural products salesmen and distributors and in planning merchandising and product promotion.

A Dow employee since 1946, Dr. Mullison has worked in agricultural chemicals for Dow International since 1953.

Hercules Powder Co. William A. Hoffman, Jr. succeeds Edwin S. Ladley as director of the Purchasing Dept. Assistant director of the Purchasing Dept. since October, 1954, Hoffman joined Hercules in 1940.

NAVAL STORES DEPT. Richard J. Both becomes director of development, succeeding Lyle W. Rothenberger, who has been transferred to the International Dept. Elwin S. Pilchard succeeds Both as manager of the Chicago sales district. Richard L. Johnson is a new technical sales-service representative in the Chicago sales district.

Philip A. Ray, manager of the Naval Stores Dept. Denver, Colo., office has retired. He had been with Hercules since 1928.

Hooker Chemical Corp. William F. Christopher has been appointed to the newly created position of director of marketing. He goes to the company from General Electric Co. where, since 1955, he has been a manager of market development in GE's Chemical Materials Dept., Chemical and Metallurgical Div.

International Minerals & Chemical Corp. Henry W. Dahlberg Jr. has been promoted to administrative manager for the Agricultural Chemicals Div.—Sales. He heads a new administrative department which will handle many of the financial and administrative functions previously handled by the division's four sales departments.

Dahlberg

Herbert S. Swan Jr. has joined IMC as supervisor, chemical and industrial advertising and sales promotion. He was creative director for J. W. Spellman, Inc., Boston advertising agency, before joining IMC, and prior to that had held advertising positions with General Electric and Procter & Gamble. Swan is a graduate of Lafayette College, Easton, Pa.

Donald G. Wolff goes to IMC's Patent Dept. as a patent attorney. He was a patent attorney with Wyandotte Chemicals Corp. and prior to that had been in patent law in the petroleum, food and paper industries.

Eli Lilly and Co. New member of the Agricultural Research Div.'s Plant Science Dept. is Irwin Frederick Brown, Jr., Ph.D. He will assist in designing and conducting experiments on the control of plant diseases at the Lilly Research Center for Agricultural Sciences near Greenfield, Ind.

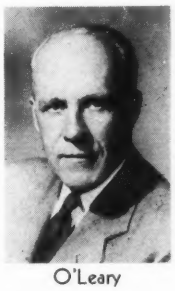
Brown

Monsanto Chemical Co. L. T. Ashlock has been assigned to the Los Angeles district sales office as a field sales representative for the Inorganic Chemicals Div., after serving as a technical service trainee.

Niagara Chemical Div., Food Machinery and Chemical Corp. Addition of J. Dean Hansen to the staff of its Jackson, Miss., branch laboratory has been announced. He will be responsible for conducting field tests on new pesticides for cotton and other crops of importance to the area.

Northwest Nitro-Chemicals. James V. O'Leary has been elected president, and Tom B. Potter executive vice president, it was announced June 2 following a meeting of the company's board of directors. Northwest is the Canadian agricultural chemicals affiliate of Commercial Solvents Corp. Its principal plant is located at Medicine Hat, Alberta.

O'Leary was previously general sales manager of Commercial Solvents. He is a master of science graduate of the University of Iowa.


O'Leary

Potter

Potter has been Northwest's sales manager since August, 1959. He first became associated with the company in 1956 as secretary and assistant treasurer.

Nowland and Co. Ray M. Schmitz, formerly a director and group vice president of General Foods Corp., joins Nowland and Co. as executive vice president, consulting staff.

Stauffer Chemical Co., Industrial Chemicals Div. Promotion of

Wyman L. Taylor to the position of assistant to the vice president—sales, has been announced. Taylor, who was previously western sales manager for the division, will now be headquartered in New York.

Stephenson Chemical Co., Inc. James H. Hoskins has been appointed vice president and general sales manager of the College Park, Ga., firm.

Summers Fertilizer Co., Inc. Brigadier General Clayton O. Totman, recently retired from the U. S. Marine Corps., became associated with Summers on June 1. As assistant vice president, his duties will be in various administrative departments, including development of a new Soil & Forest Conservation Div.

Gen. Totman

A native of Conway, Mass., General Totman graduated from the University of Maine in 1935 with a B.S. in Forestry. He was commissioned a Second Lieutenant, U. S. Marine Corps. in 1935 and served continuously for 25 years until his retirement Nov. 1, 1959.

His final assignment was special assistant to the secretary of the Navy developing Policy and Management of the Navy's Programs for Conservation of Soils, Water, Forests, Grasslands, Fish and Wildlife. During his leaves from duty, he has developed his own conservation program by establishing a sizable tree farm in Maine on which he has planted 50,000 spruce trees.

Witco Chemical Co., Inc. Promotion of William J. Ashe to administrative and financial vice president of Witco Chemical Co., Inc., has been announced by Max A. Minnig, company president. Before his promotion, Ashe was controller and assistant secretary. In his new position, Witco's accounting, legal, traffic and insurance departments report to him.

Chemicals

DU PONT OFFERS NEW AMMONIATING SOLUTION

A new ammoniating solution that "promises premium quality conditioning" of pulverized mixed fertilizers now is being offered by Du Pont Co. Called Du Pont "Uramon" ammonia Liquor-K, the solution contains 40 per cent nitrogen. Conditioning advantages, Du Pont says, are provided by methylene ureas which minimize bag caking and improve handling properties on the farm.

Successful commercial trials with large quantities of pulverized 5-10-10 this past year have demonstrated the practical value of this product, Du Pont reported. In addition to pulverized mixtures, it also can be used for making high quality granulated mixtures with more uniform granules, the manufacturer states. For details,

CIRCLE 233 ON SERVICE CARD

MALATHION IS EFFECTIVE IN STORED GRAINS

Malathion is a safe and economical treatment for low levels of insect infestation and damage in stored grain, according to recent research by USDA.

Researchers of USDA's Agricultural Marketing Service report that a malathion spray or dust, applied at the time of storage, will effectively protect grain for a full storage season, provided recommended procedures are followed.

Malathion has no effect on the odor or flavor of bread made from treated wheat, the AMS studies show. It also does not impair germination of seed or grain.

Proper spray treatment is:

1) Use an emulsifiable concentrate of 57 per cent premium-grade malathion at the rate of 1 pint in 2 to 5 gallons of water for each 1,000 bushels of grain.

2) Use good spray equipment, calibrated for exact measurement and uniform distribution of the spray. Amount of water, operating pressure of the spray pumps, and size of nozzle opening vary, depending on grain rate of flow.

3) Avoid spraying with a fine mist which drifts away by using low nozzle pressure. Shield the nozzle against wind and air currents.

A spray is usually preferred to a dust, USDA said, because the spray doesn't add to the dust content of the grain.

Recommended treatment for dusting is a 1 per cent premium-grade malathion powder at the rate of 60 pounds per 1,000 bushels. Dust should have an organic base.

The loss of malathion during spraying and dusting and during the first three weeks after treatment drops the rate of deposit well under the limits set by the Food and Drug Administration, USDA said.

SAMINCORP. ANNOUNCES NEW SEED DISINFECTANT

Samincorp. (South American Minerals & Merchandise Corp.) reports that a new seed disinfectant, methyl mercury pentachloro phenolate compound "473," has "very good possibilities."

According to a technical data sheet, the compound controls loose smut of oats as volatile mercury fungicides do, controls bunt of wheat and is less phytotoxic than other products.

The data sheet includes results of field experiments with the product as well as greenhouse experiments with combined mercury-insecticide seed disinfectant. A copy of the sheet can be obtained by

CIRCLING 234 ON SERVICE CARD

DYRENE REGISTRATION

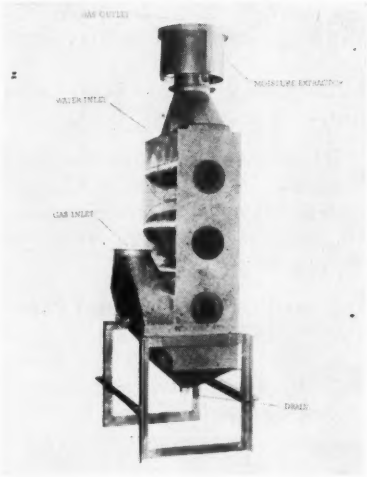
Dyrene, a foliage fungicide produced by Chemagro Corp., is now registered in the U. S. and Canada for control of dollar spot, melting-out, and rust on lawns and turfs. It also is registered for control of leaf spot on gladiolus in the U. S.

AMCHEM OFFERS SESONE

Amchem Products, Inc., reports it recently took over the responsibility for sales and further development of Sesone herbicide. The herbicide has been proved as a means of preventing annual broadleaved and grass weeds in nursery stock, strawberries, peanuts and other crops and plants, Amchem said. It will be available in two pound bags and in 50 pound drums.

Equipment Supplies

HYDRO-VOLUTE SCRUBBER FROM JOHNSON-MARCH



Called the Hydro-Volute, a new scrubber from The Johnson-March Corp. can be used virtually anywhere in industry where dust, fume or odor problems exist, the company says.

Scrubbing is achieved by vortexing the gas flow in a series of chambers. Each chamber is shaped to produce a swirling action within the chamber so the gas is scrubbed with water and wetted dust particles are centrifuged out of the gas stream. Gas flows through venturi-shaped throats between chambers. The venturies increase gas velocity to impinge wetted dust particles against the wall and obtain more violent vortexing and, thereby, more positive scrubbing. Capacities are available from 1,000 cfm to 60,000 cfm. For details,

CIRCLE 235 ON SERVICE CARD

POSITIVE DISCHARGE BUCKET ELEVATORS ANNOUNCED

Positive gravity discharge is featured on two new series of bucket elevators from the Bucket Elevator Co. The buckets are mounted between two elevator chains and passed over large head sprockets. Buckets are then inverted directly over the discharge spout by snubber sprockets providing positive discharge of material. The manufacturer says low bucket speeds make these elevators ideally suited for handling abrasives and materials of large or irregular particle size.

The "VP" series features cantilever design with full access to the interior for easy cleaning. The "GP" series provides an elevator for general purpose applications. For details,

CIRCLE 236 ON SERVICE CARD

BARRINGTON MIXER

A complete line of mixers for the laboratory and for production is now available under the name of Barrington Convertible Jet Mixer, reports Barrington Industries, Inc. Models range from ¼ hp to 15 hp, with mixing capacities from 3 gallons to 3,000 gallons. Each model may be converted in seconds

(Continued on page 52)

FOR SALE: Bemis 3 bucket electromechanical open mouthed bagger, Series #6107, contact parts—stainless steel, very accurate, available July 1st—$500. C. Roy Curtis & Son, Inc., Marion, N. Y.

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from closed turbine to open turbine mixer, or vice versa, Barrington says.

The mixers mix, blend, disperse and homogenize materials of any viscosity which can be pumped or forced through the mixing head, the manufacturer claims.

Details are available. Just
CIRCLE 237 ON SERVICE CARD

STURTEVANT TRIPLES PULVER-MILL CAPACITY

Sturtevant Mill Co.'s Pulver-Mill, an impact mill with integral air classifier which had a capacity of up to 50 CWTs an hour when introduced in May 1959, now is available in capacities up to 150 CWTs hourly.

Like the smaller mill introduced last year, the triple-capacity unit offers double-impactor grinding, deflector wall construction and adjustable air classification, Sturtevant said.

Get more information by
CIRCLING 238 ON SERVICE CARD

Suppliers Briefs

Bemis Bro. Bag Co. Net income of the company and its subsidiaries for the first three months of this year was $724,749, about 12 per cent higher than the first quarter of 1959. After taxes and preferred dividends, earnings per share of common stock were $1.02 for the first three months of 1960, as compared with 92 cents a year ago.

Consolidated sales for the first quarter were $32,419,792, slightly higher than those for the first three months of 1959.

Dorr-Oliver Inc. Charles H. Scott has been named chief mechanical development engineer. He is considered the company's most prolific inventor, since he has been granted 57 patents by the U. S.

Gilman Paper Co. was featured in the April issue of Pulp & Paper. Articles point to the growth of the company, both north and south, and describe the enormous horseshoe-shaped woodyard at St. Marys Kraft Corp.

The following changes in executive and sales personnel were effected June 1:

Harry C. Lawless became a staff vice president of Gilman and its subsidiaries and a member of the Executive Advisory Committee.

Dean Wellington becomes general sales manager with authority over the sales of the following divisions:

Standard Products Div.—William Peist, sales manager.

Specialty Papers & Pulp Div.—Robert Bringman, sales manager.

Multiwall Bag Div.—Edward Burgers, Jr., sales manager.

Bleached Board Div.

Tom L. Jones, former vice-president and director of multiwall sales of Arkell & Smiths, and recently regional sales manager of the Multiwall Div. of West Virginia Pulp and Paper Co., has joined Gilman as special representative in the Multiwall Bag Div.

International Paper Co. Bagpak Div., F. Henry Savage, vice president-marketing, has been elected to the board of directors.

Appointment of R. R. Worthington as assistant general manager, Bagpak Div., has been announced by A. A. Scholl, division general manager. Worthington, who joined International Paper as a chemist in 1934, has been a member of the Bagpak sales staff since 1936.

R. A. Gair succeeds Worthington as sales manager, and C. H. Crain replaces Gair as West Coast district sales manager.

Richardson Scale Co. has named C. A. Cremens as Chicago district manager. Formerly a sales engineer, he has been with the firm for 14 years.

West Virginia Pulp and Paper Co. Art Nichols, manager of West Virginia's Sewing Machine Clinic Service, points out salient features of sewing machine used to stitch

multiwall bags. Occasion was the American Feed Manufacturers Assn. recent Chicago meeting. Left to right are Ralph Poynter, Illinois Farm Supply; S. Y. Carnes, Westvaco; John O. Frahm, Westvaco; Casey Proefrock, Illinois Farm Supply; Art Nichols; Lehman Keith, Hermitage Mills; and Weldon Fogel, Illinois Farm Supply.

John Floyd has been promoted to the new position of technical sales service manager for the Multiwall Bag Div.

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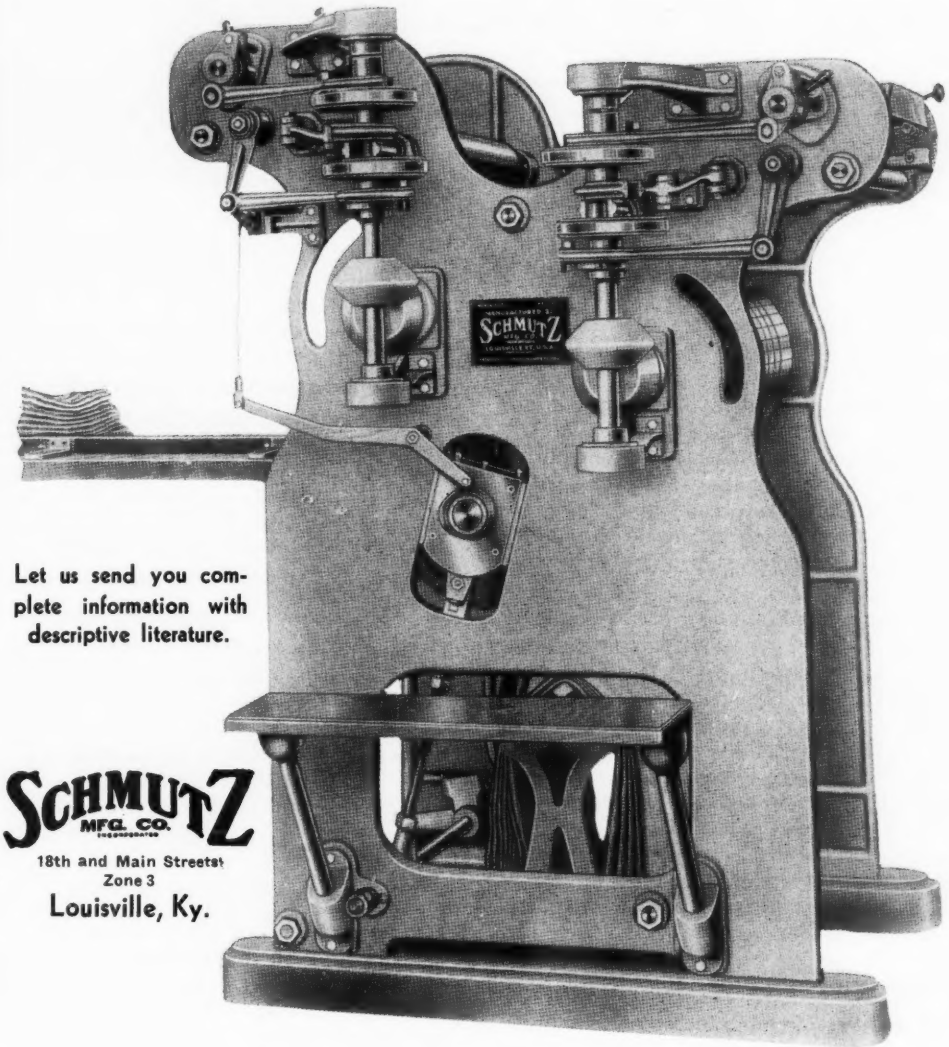

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THE DOLLARS AND CENTS OF Range and Meadow FERTILIZATION

By ROY C. LIPPS*

IN MANY segments of our economy one hears of harsh economic facts which businessmen are facing. What of the intermountain rancher? Are competitive forces at work in the cattle business? Certainly, foreign beef, such as Australian, can enter California ports for 8¢ per pound which includes a tariff duty of 3¢. This is good lean boneless meat and represents real competition.

Domestic beef produced in other areas is becoming increasingly competitive. Arizona can grow meat very cheaply using fertilized coastal bermuda grass and cotton by-products. This same combination is working in the southeastern United States. In fact, fertilized and pelletized coastal bermuda grass can be fed as a protein supplement in combination with low quality feeds. Beef is being grown cheaper and cheaper as other areas find that well managed grassland and profit are synonymous. On the other hand, in many parts of the Intermountain West, I hear of declining range and meadow yields and grazing allotment reductions or restrictions.

HOW TO IMPROVE EFFICIENCY

What can the intermountain rancher do to improve his efficiency? The know-how is available—all he has to do is apply it. As an example, Dr. C. W. Cook, Professor of Range Management at Utah State University, says, "It is my personal opinion that if we were to apply all of our know-how on range management and point our objectives to producing maximum meat per acre on a sustained yield basis, we could handle one-half again as many animals as are now grazing our summer ranges." Good management can do much more in our irrigated meadow areas.

FERTILIZER AND GOOD MANAGEMENT NEEDED

Fertilizer is no magic cure-all. It must be used with other good management practices. For instance, some very fine research work on Wyoming meadows conducted by Rulon Lewis, U.S.D.A., illustrates the differential response to fertilizers that can be expected from different species of grass. The following information from his studies should point this out.

WYOMING

Table 1: NATIVE MEADOWS — ECONOMICS OF FORAGE & PROTEIN PRODUCTION, INTERMITTENT IRRIGATION

Nitrogen (Lbs./A)	Forage Yield (T/A)	Protein (%)[1]	Fertilizer Cost: Per Lb. Protein	Fertilizer Cost: Per Ton Hay[1]
0	1	8	—	—
80	2	8	6.7	10.70
160	3	11	4.3	10.70

Results from experiments at nine different locations are composited and presented in Table 1. Native meadows in Wyoming showed a very marked response to nitrogen fertilizer. Both yields and protein content of forage were materially increased. At the 160 pound per acre nitrogen rate protein was produced for 4.3¢ per pound while hay was grown for $10.70 per ton. These prices are less than one-half the current market price.

What happens when we improve management still further—fertilize improved species of grass?

* *Agronomist, United States Steel Corporation, Salt Lake City, Utah. Presented at the First Intermountain Meadow and Range Fertilization Conference, February 19, 1960 at Ft. Collins, Colorado.*

[1] *All returns from applied nitrogen based on crude protein and hay yields were computed using 10¢ per pound and $20.00 per ton, respectively except for Montana Data where beef value was placed at 23¢ per pound.*

Cattle graze on reseeded Intermediate wheatgrass in Pike National Forest, Colorado. Photo by U. S. Forest Service.

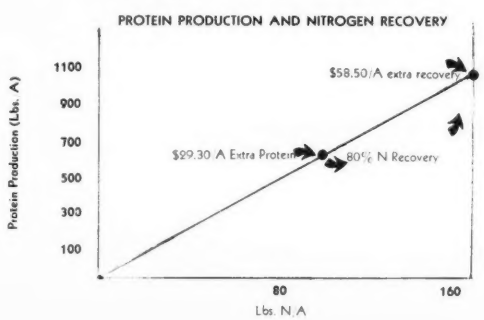
Table 2: IMPROVED SPECIES — ECONOMICS OF FORAGE AND PROTEIN PRODUCTION, INTERMITTENT IRRIGATION

Nitrogen (Lbs./A)	Forage Yield (T/A)	Protein (%)	Fertilizer Costs: Per Lb. Protein	Per Ton Hay
0	1.0	7.0	—	—
80	3.0	8.0	3.2	5.35
160	4.2	12.0	2.3	6.70

Results from 14 experiments, composited in Table 2, show further reductions in hay and protein production costs. One hundred sixty pounds of nitrogen per acre produced protein for 2.3¢ per pound and hay for $6.70 per ton, about one fourth current market price for these two commodities. These are real efficiencies and can do much to protect the intermountain rancher against competition or falling prices.

Many ranchers wonder what happens to nitrogen on their meadows—is it lost to the atmosphere or in the ground water. Data from work by Rulon Lewis, U.S.D.A. and Robert Lang, University of Wyoming, are reproduced in Figure 1.

Figure 1: WYOMING



Nitrogen recovery was calculated. Eighty per cent of the applied nitrogen found its way into the plant during the first year. Recovery of this order is exceptional and is reflected in high per acre protein production figures. After subtracting fertilizer costs, 160 pounds of nitrogen per acre produced $58.50 worth of protein. In addition this rate may have some carryover into the next season.

What of other inter-mountain states—will Wyoming results apply? Idaho and Utah have not investigated meadow fertilization in detail but fertilizer demonstration trials conducted in these states by their extension services should indicate what sort of general fertilizer response can be obtained.

Eight fertilizer demonstrations conducted by county agents in the Stanley Basin and Salmon areas of Idaho gave these average results:

IDAHO

Table 3: FORAGE AND PROTEIN YIELD

Nitrogen (Lbs./A)	Forage Yield (T/A)	Protein (%)	Increase over check: Yield (T/A)	Protein (Lbs./A)
0	1.7	9.4	—	—
50	2.4	9.3	+0.7	+126
100	3.0	13.3	+1.3	+478
200	3.3	15.5	+1.8	+703

Again there was an orderly increase in yield and protein percentage of the forage. Two hundred pounds of nitrogen per acre produced 703 pounds more protein than did unfertilized grass.

Table 4 shows that from an economic standpoint nitrogen fertilizer was a very profitable practice under ordinary ranch conditions in Idaho.

IDAHO

Table 4: ECONOMICS OF FERTILIZER USE

Nitrogen (Lbs./A)	Hay Return/Acre Above Fertilizer Cost	Protein Return/Acre Above Fertilizer Cost
0	—	—
50	$ 6.25	$ 5.85
100	12.50	34.30
200	11.00	43.30

All rates of fertilizer paid for their use in added forage or protein and gave an extra excellent return ranging from $12.50 per acre for hay to $43.30 per acre for protein production. Numerous trials in Utah using various forms of dry nitrogen fertilizers and the liquid-gas nitrogen carrier, anhydrous ammonia, have given very similar results.

Donald E. Baldridge, research worker at the Huntley Branch Experiment Station, Huntley, Montana,

has very carefully measured the power of nitrogen to increase production of an old Kentucky Bluegrass—Orchard grass meadow. All phases of management were carefully controlled. Total Digestible Nutrients (TDN) production, the best way to measure forage quality, is presented in Table 5.

Table 5: FORAGE AND TDN YIELD

Nitrogen (Lbs./A)	Tons of Air Dry Material/Acre: Single Application	Split Application	Yield of TDN (Lbs./A)
0	1.6	—	1720
50	2.2	2.2	2390
100	2.7	2.8	3030
200	3.8	3.8	4110
400	4.8	5.3	5830
600	5.6	5.9	6480

Production of forage and TDN showed a remarkable increase as increasing rates of nitrogen were used. At the high rate of nitrogen (600 pounds per acre), almost 6 tons of air dry forage was produced.

Cattlemen naturally are most interested in beef production. Beef yield at the various nitrogen rates were calculated from TDN values. Beef yield together with protein percentages are presented in Table 6.

MONTANA

Table 6: PERCENT PROTEIN CONTENT AND BEEF YIELD

Nitrogen (Lbs./A)	Percent Protein (Seasonal Average)	Beef Yield (Lbs./A)
0	12.5	210
50	12.4	291
100	13.4	370
200	15.1	501
400	19.0	711
600	20.3	790

Fertilized meadow forage cut at the correct stage of growth has a remarkably high protein content. Six hundred pounds of nitrogen per acre gave a seasonal average protein content of 20.3%. Animals relish this high quality feed. Meadows receiving high nitrogen fertilization produced 580 pounds more beef per acre than did the unfertilized meadow.

These increases in yield of hay and beef are impressive but are they obtained profitably to the rancher? Table 7 presents the economics of this experiment.

MONTANA

Table 7: ECONOMICS OF FERTILIZER USE

Nitrogen (Lbs./A)	Gross Value per acre	Total Costs per acre	Net Return per acre
0	$48.30	$40.60	$ 7.70
50	66.90	55.00	11.90
100	85.10	65.10	20.00
200	115.20	84.50	30.70
400	163.50	118.80	44.70
600	181.70	150.80	30.90

Net Profit increased to a maximum of $44.70 per acre when 400 pounds of nitrogen per acre was used. All costs involved in grazing pasture with beef cattle were subtracted including the cost of fertilizer. Three hundred acres of meadow managed this way would net the rancher an additional $13,400. This extra bonus is the wages of good management.

What of our reseeded non-irrigated ranges—can fertilizer be used there? Very little is known about the economics of dry range fertilization. However, Dr. C. W. Cook, Utah State University, has conducted a preliminary study of this problem. Fertilizer was fall applied to a created wheat grass seeding in a 12 inch rainfall area. Data from this experiment are shown in Table 8.

UTAH

Table 8: BENEFITS FROM DESERT RANGE FERTILIZATION CRESTED WHEAT GRASS

40 lbs. N/A applied fall 1957 increased:

	Value
1. 1958 Forage production by 521 lbs.	5.21
2. 1959 Forage production by 0 lbs.	00
3. 1958 Forage utilization by 25%	—
4. 1959 Forage utilization by 26%	—
5. 1958 Protein percentage by 2.1%	—
6. 1959 Protein percentage by 2.7%	—
7. 1958 Protein production/A by 74 lbs.	7.40
8. 1959 Protein production/A by 13 lbs.	1.30
9. 1958 Total digestible nutrients by 264	10.40
10. 1959 Total digestible nutrients by	—

Return above fertilizer cost ($5.00)

Forage production	$0.21/A
or Protein production	$3.70/A
or Beef production	$5.40/A

Results were encouraging. Application of 40 pounds of nitrogen per acre on seeded foothill range increased forage production, protein content, forage utilization and total digestible nutrients. Five dollars forty cents worth of beef per acre was produced above fertilizer costs. Much more research work needs to be done on the effects of fertilization on reseeded grass growing in our important dryland range areas.

I have tried to present the economics of fertilizer use on meadows and ranges—a very difficult job. Many of the benefits from proper fertilization are very hard to measure. The following list includes some of these very important benefits but benefits which are difficult to measure in terms of dollars and cents.

Other economic benefits:

1. You can have earlier grazing.
2. You can have aftermath fall grazing.
3. You can get more feed from the same acres or in effect double or triple meadow area.
4. You can reduce labor costs.
5. You can fight both drought and cold weather.
6. You can improve the quality of your forage.
7. You can save your soil and irrigation water.
8. You can make irrigation pay.
9. You can get fertilizer carry over.
10. Fertilizer use can provide ranch management efficiencies.

Intermountain ranchers can well take the council of our first president, George Washington. He said, "My countrymen have too little knowledge of the profits from grassland." In this day and age we have the knowledge. All we have to do is put it into practice and intermountain ranchers will reap the profits President Washington was talking about. ▲

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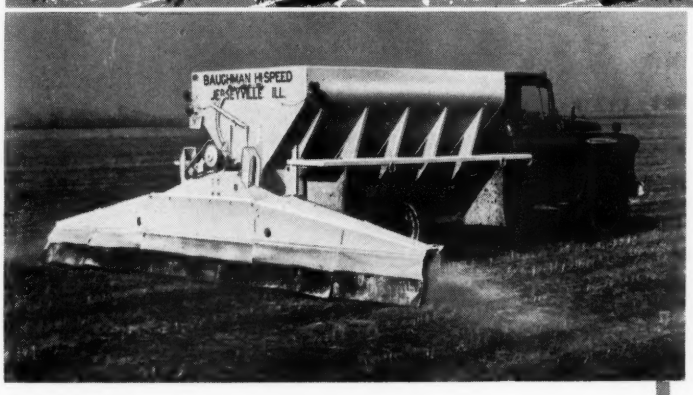

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EDITORIAL

FC

Everything Depends on a Profit

As company president, are you still the "No. 1 salesman" in your organization?

Do you hate "facts and figures"?

If so, your days as a major competitor in the farm chemicals industry are fast fading!

We are entering a new era of selling. Even some of the old diehards who have clung tenaciously to the idea that it's still the *salesman's world* are beginning to weaken.

Two characteristics of fertilizer and pesticide company management are indicative of success, according to Commercial Discount Corporation —one of the nation's leading commercial finance companies, located in Chicago.

They are management's disposition to "worry" about 1) facts and 2) figures!

The company listed lack of projected sales, operating problems, and capital requirements as primary factors in business failures.

"The second characteristic," the company points out is "management's disposition to worry about *numbers*. For example, we recently found a good-sized manufacturing company which had been losing money on one of its products every year for 15 years, *simply because the president 'hated figures' and failed to keep tabs on separate products.*"

The company president just described may have come up through the ranks and still regards his long-standing reputation as "No. 1 salesman" as the biggest asset his company owns.

He doesn't know how to figure his share of the market . . . or measure profits . . . and he doesn't care. Year after year he plays the game of "Fool Yourself."

But we've painted a black picture. Now here's the kind of management thinking that's in tune with the times . . .

"The Man From Rolla, Missouri" has to be *shown* that he can't stay in there and slug it out with the big cooperatives that are getting *bigger* in his marketing area. Murray C. Renick of the Rolla Feed Mills sells fertilizer, insecticides, feed and a lot of other farm supplies. But the product he lists as most vital of all is . . .

. . . a **profit!**

Renick told members of the National Plant Food Institute, who met for their annual meeting at the Greenbrier last month:

"Many confused dealers in my state had been losing money for years and didn't even know it! They were using up their assets and were operating on depreciation."

One of the most important tools necessary for a sound business today, Renick declared, is to *know how to measure profits.*

We've got to streamline our thinking about *profitable* marketing if we are to stay in business in the sixties. We must get away from the price . . . tonnage concept where many times the product is given away in order to move it. Several speakers at the convention stressed the fact that price never holds a customer for long anyway. But SERVICE will!

More important than price and tonnage are these questions:

- ▶ What's it costing me to do business?
- ▶ What will my profit margin be?
- ▶ What is my image?

Midst the maelstrom of products being pushed to farmers these days, fertilizer stands out as the one needing the most aggressive action. Too many people have gotten into the act over the years. And there's been too much talk about selling it *dirt cheap!*

As a result, the industry should *e-evaluate its policies* all down the line. That means the manufacturer, the distributor, the dealer, the county agent, and the vo-ag teacher.

"The Man From Rolla" whom we quoted earlier in this editorial is affected by what the county agent tells his farmer customers. In fact, this dealer's entire *profit picture* depends upon how effectively county agents—and vo-ag teachers—educate farmers.

In line with this, FARM CHEMICALS would like to make the following proposal:

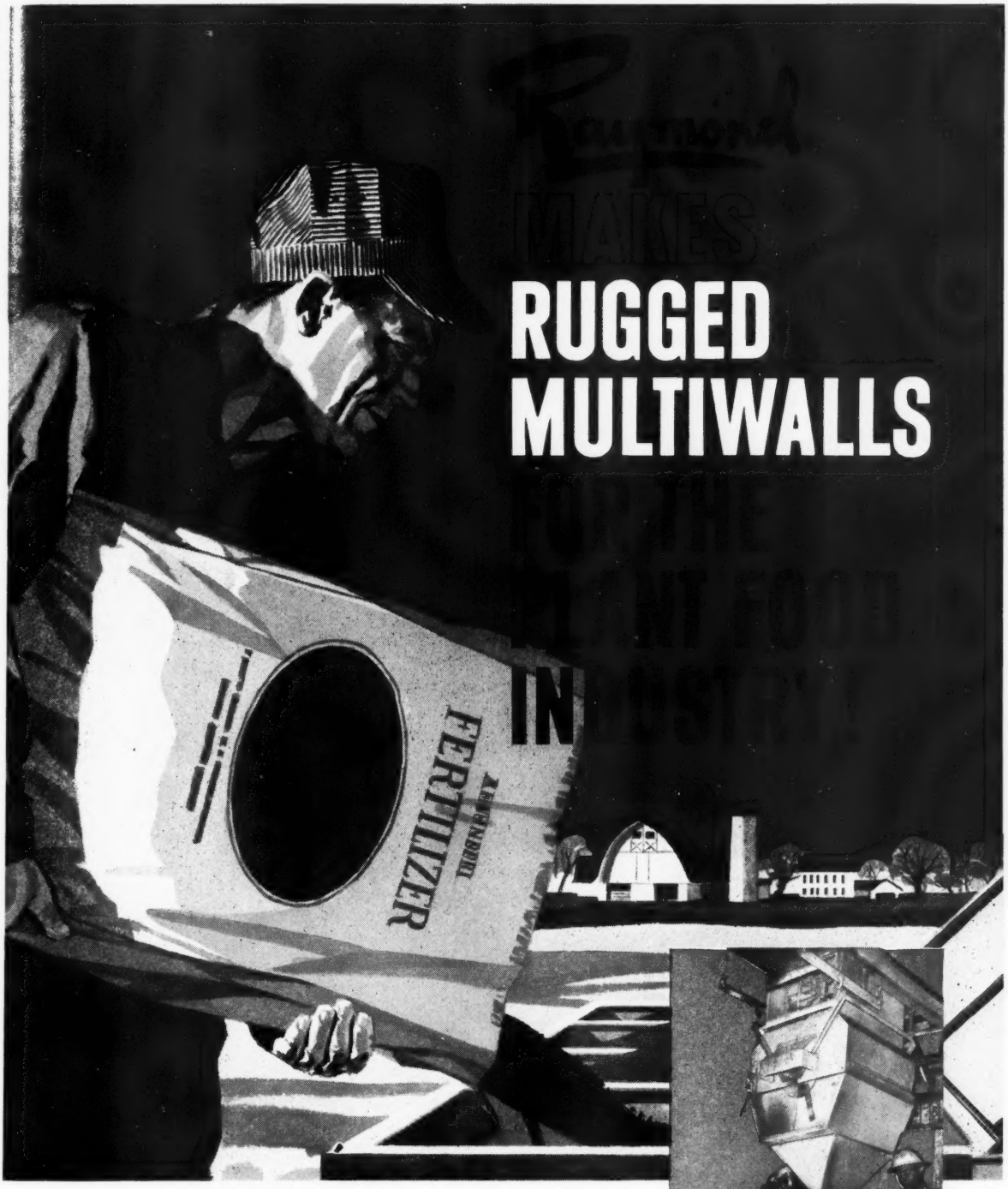
Every agricultural college dean, extension agronomist, county agent, and vo-ag teacher in the country should be presented with the "Story of Marketing Fertilizer."

It should be pointed out that profitable marketing is *essential* in today's economy . . . that profitable marketing means profitable customer-making . . . that fertilizer companies need and should *expect* a profit, as well as those companies manufacturing feed, machinery and other products.

The industry should pool its talents to present this "profit story" (in booklet, movie and other forms) to everyone involved in SELLING FERTILIZER to farmers.

It would help to promote the fact that in a democracy EVERYTHING—and we mean everything—depends on a profit!

GORDON L. BERG



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